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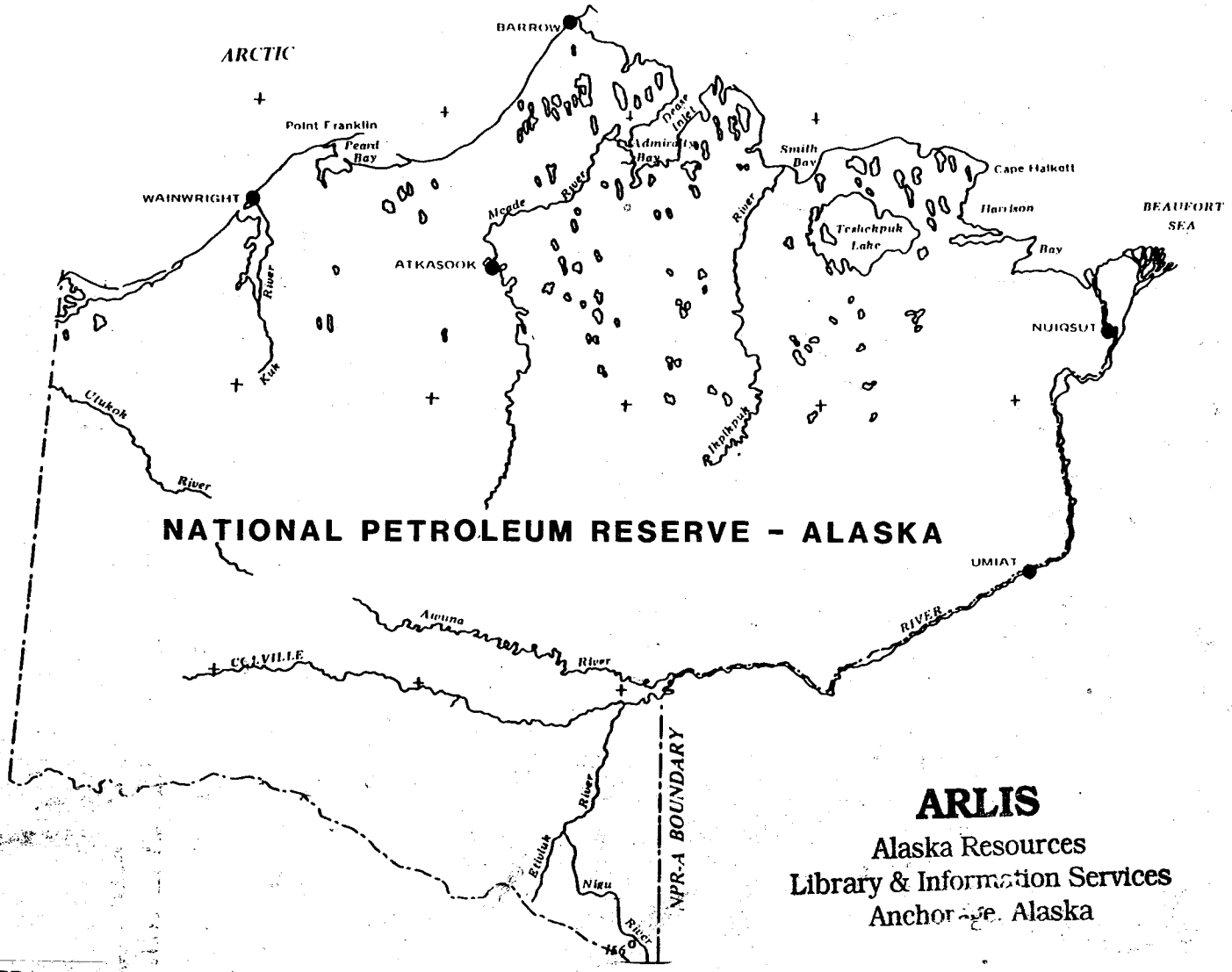
NPR-A
NATIONAL PETROLEUM RESERVE - ALASKA
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCOPING DOCUMENT FOR FUTURE OIL & GAS LEASING IN NPR-A



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Anchorage, Alaska 99513

February 1982

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Dear Reader,

In 1980 in our Department of Interior Appropriation Act, Congress required that we begin an expeditious program of oil and gas leasing in the National Petroleum Reserve in Alaska (NPR-A). To indicate the merit of expeditious leasing, Congress exempted the first two million acres to be offered in NPR-A from further compliance with the National Environmental Policy Act (NEPA). Congress, recognizing the abundant wildlife, scenic, and cultural values in NPR-A, required that leasing and development be done sensibly with maximum reasonable protection given to NPR-A surface values.

We have scheduled two 1982 sales to meet the Congressional objective of offering two million acres. As part of the effort leading to the identification of these lands, an Environmental Assessment (FEA of October 1, 1981) cleared 4.56 million acres for leasing. To meet the Congressional mandate of a leasing program, lands outside this 4.56 million acre area must be available. These lands must be analyzed in a NEPA document. NEPA does not, as some believe, prevent a Federal agency from implementing actions which would impact the environment. NEPA requires that the agency analyze the possible harm from the agency's decisions, design alternatives which minimize that harm and then compare the harm resulting from implementation of the best alternative to the benefits of the action.

To begin this NEPA analysis, the Council on Environmental Quality requires Federal agencies to use a "scoping" process to initiate an Environmental Impact Statement on major Federal actions. "Scoping":

(1) Identifies local, regional and national concerns about the decision to lease;

(2) Places boundaries around areas with common values or which share common issues so the impact analysis can focus on these "study" areas;

(3) Develops alternatives which may reduce impacts on surface values; and,

(4) Provides the public the opportunity to suggest additional concerns, identify additional values, affect the placement of boundaries and alter the number or content of alternatives.

The enclosed document identifies areas which may require an EIS as the appropriate NEPA analytical tool. Other areas of the Reserve possibly could be opened to leasing using the standard stipulations developed in the October 1, 1981 Environmental Assessment (EA) or through a tract specific EA once tracts have been delineated for future sales.

The Bureau of Land Management will carry out the mandate of expediting oil and leasing in NPR-A. With your help we can do a better job of leasing. With your help we can do a more complete and careful analysis of the implications of our leasing decision. Please read this scoping document and get personnally involved in helping us with this important decision.

Written comments on this document should be sent to the Program Manager, NPR-A, 701 "C" Street, Box 13, Anchorage, Alaska 99513. Comments must be received by March 26, 1982 if they are to be considered during the development of the May decisions. Oral comments will be heard at public meetings held in March.

Sincerely yours,

State Director

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1982

SCOPING DOCUMENT

FOR FUTURE OIL AND GAS LEASING

IN THE NATIONAL PETROLEUM RESERVE IN ALASKA

U. S. Department of the Interior
Bureau of Land Management
NPR-A Program Staff
Alaska State Office
Anchorage, Alaska

February 1, 1982

TABLE OF CONTENTS

		Page
A.	Introduction and Overview	5
B.	Probable Environmental Impact Statement Issues	13
1.	Analysis of NEPA Significance for Biological Resources	13
a.	Caribou	17
b.	Other Biological Resources	21
(1)	Dall Sheep	21
(2)	Grizzly Bear	21
(3)	Polar Bear	24
(4)	Shorebirds	28
(5)	Geese	30
(6)	Ducks	32
2.	Socio-Cultural and Subsistence Issues	35
3.	Wild and Scenic Study Rivers	40
a.	Wild and Scenic River Designation	46
b.	Status Quo - No Designation	47
c.	Areas of Critical Envriormental Concern (ACEC)	47
d.	Birds of Prey Natural Area	47
4.	Proposed Alternatives	47
C.	Issues With No Significant Impacts	49
1.	Biological Resources	49
a.	Moose	49
b.	Wolf	49
c.	Wolverine	49
d.	Arctic Fox	52
e.	Red Fox	52
f.	Muskox	52
g.	Tundra Hare	52
h.	Gulls, Terns and Jaegers	52
i.	Ptarmigan	53
j.	Passerines	53
k.	Peregrine Falcons	53
l.	Other Raptors	53
m.	Loons	55
n.	Whistling Swans	55
o.	Fisheries	55
p.	Threatened and Endangered Plants	57

	Page
2. Other Issues	57
a. Slope	57
b. Soil/Permafrost	60
c. Off-road Traffic	61
D. Probable Legal Restrictions to Leasing	62
1. Native Allotments	62
2. Airfield Facilities	62
3. Exchanges	62
4. Boundary Problems	63
5. Mineral Leasing of Village Lands	63
Literature Cited	

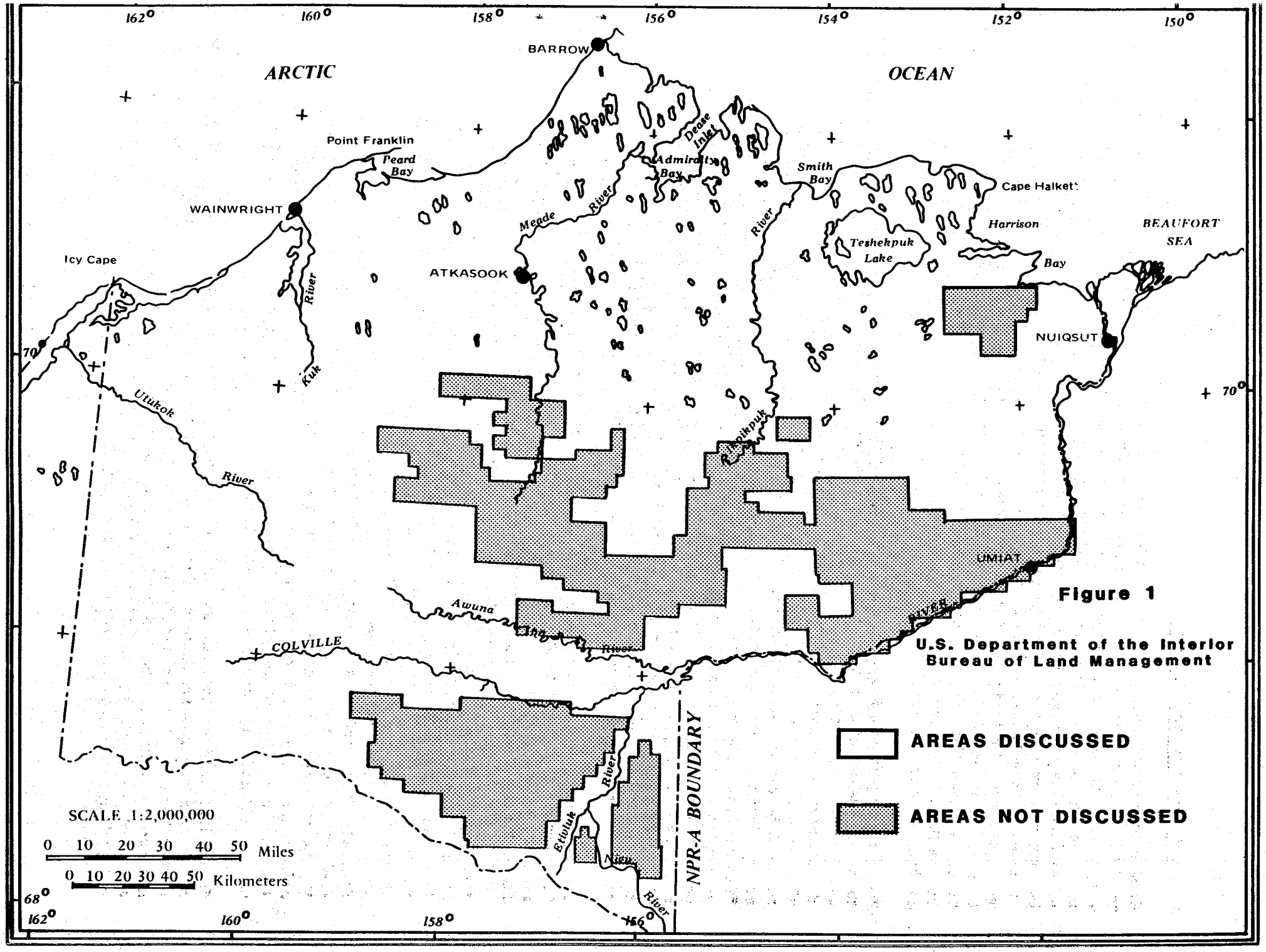
A. Introduction and Overview

This document discusses the implications of continuing oil and gas leasing on the NPR-A environment within the areas shown in Figure 1. Normally, such assessments begin with a proposed action and a set of meaningful alternatives and then set out the significant impacts on the environment of the proposed action and the alternatives. A proposed action according to 43 CFR 1601.0-5 is "any resource use or development or management action, (such as leasing) proposed to the Bureau of Land Management ...through any procedure established by regulations including nominations, petitions, and applications. "Congress in Public Law 96-514, the Department of Interior Appropriation Act for FY 1981, mandated "an expeditious program of competitive leasing of oil and gas in the National Petroleum Reserve in Alaska ...." Clearly this Congressional mandate appears to meet the requirements of a proposed action.

Because this proposed action is a Congressional mandate, there does not appear to be any meaningful alternatives to the proposed action. There are, however, meaningful alternatives within the proposed action. These alternatives include the phasing of leasing, the size of lease units offered, and the development of a "suitability test" to indicate some zones within the Reserve which ought to be deferred or eliminated from leasing. The test will consider the present state of the art of Arctic technology, the effect of oil and gas activities on fish and wildlife resources, and lack of biological data in some areas. The suitability test ultimately should produce alternative ways of managing development to minimize environmental impacts through the use of protective stipulations and other mitigatory measures. The need to analyze these alternatives within the context of an Environmental Impact Statement (EIS) hinges on the determination of whether leasing would be a "major Federal action" in all of the Reserve or only in parts of it.

The Secretary of Interior delegated the Director of BLM to select the lands to be offered at the first sale(s) and to fullfill all administrative and legal requirements for holding such a sale and future sales. The staff of the BLM State Director was given responsibility after consultation with the U.S. Geological Survey for completing the necessary identification of lands to be offered. The authority to do so was provided in P. L. 96-514, the Appropriations Act which mandated that additional National Environmental Policy Act of 1969 (NEPA) compliance would not be required to lease up to 2 million acres of the NPR-A. It also stated that Sections 202 and 603 (Planning and Wilderness) of the Federal Land Policy and Management Act (FLPMA) are not applicable to NPR-A. Early in the process, following coordination and consultation with Federal, State and local agencies, BLM decided that an Environmental Assessment (EA) would be a useful tool to identify the initial areas to offer for lease. The EA provided a framework for exchanging views with interests affected by oil and gas leasing, for indicating areas within the Reserve where oil and gas leasing could take place without significant adverse effects on the environment, and for discussing future sale decisions.

The Appropriations Act, as amended, only exempted the leasing of two (2) million acres from the requirements of Section 102 (2)(c) of NEPA. The 23 million acres of the Reserve were evaluated for environmental risks that could result from oil and gas production. About 5.8 million acres (Study Area A - G, in Figure 2) were selected for study because they have few or no legal constraints and very high oil and gas potential according to industry and the U.S. Geological Survey.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ATKASOOK
Meade River
Admiralty Bay
Dease Inlet
Smith Bay
Cape Halkett
Harrison Bay
Teshekpuk Lake
BEAUFORT SEA
NUIQSUT
Ikpikpuk River
UMIAT
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Ikpikpuk River
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Etivluk River
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Figure 1

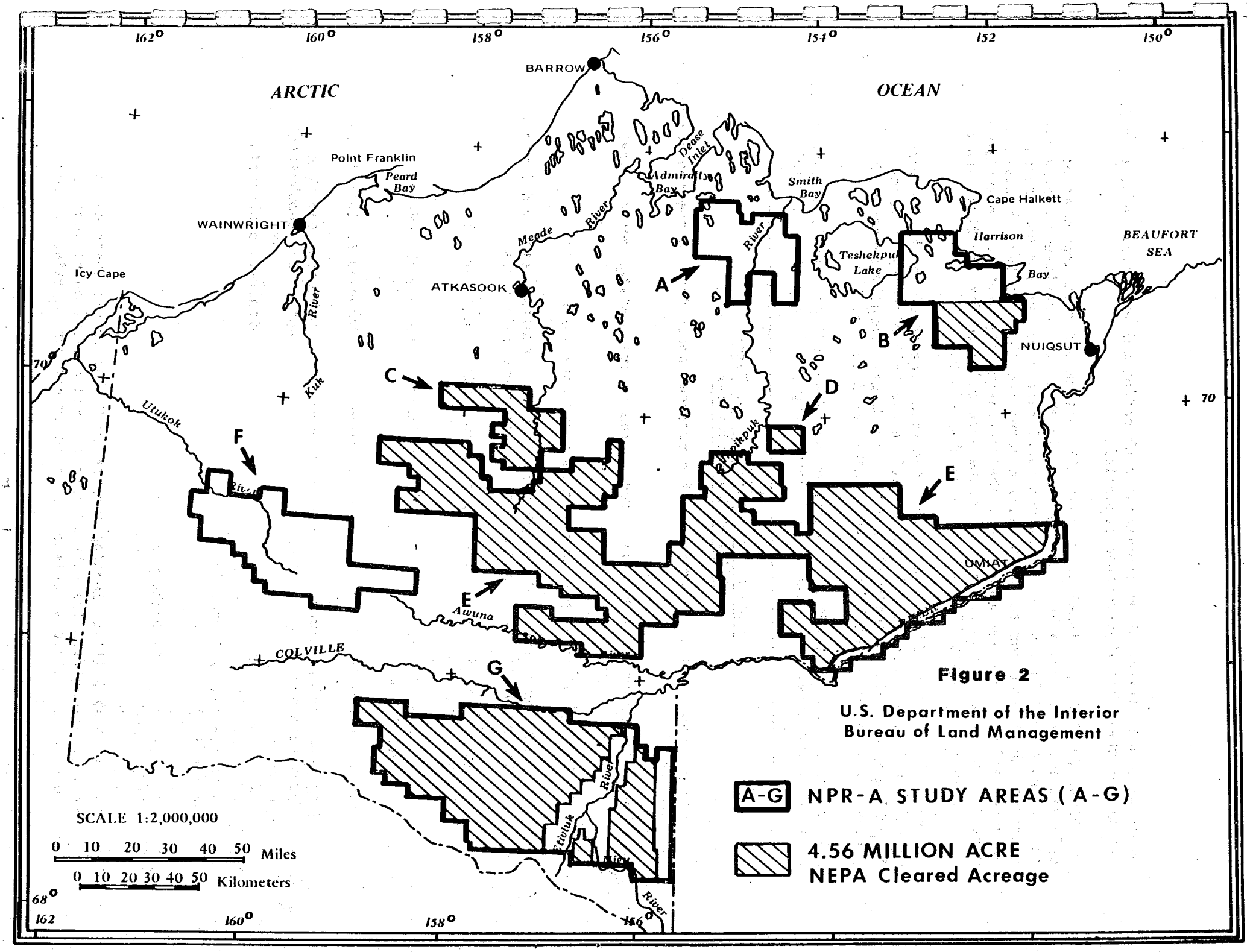

Figure 2

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Areas with some degree of environmental risk and/or cultural concern were included because of their high hydrocarbon potential.

The Final EA (FEA) published in October 1981 determined that approximately 4.56 million acres could be leased without further NEPA compliance documentation (Figure 2). This was based on the conclusion that the FEA had adequately addressed the issues for the 4.56 million acres and that the basic mitigation measures/stipulations had been established to adequately protect the environment. From those acres, 1.5 million acres were selected for the first lease sale (Figure 3) January 27, 1982 in Fairbanks, Alaska.

The remaining 3.06 million acres within the area considered by the FEA will provide lands for a second sale to be held in mid 1982 offering at least 500,000 acres. This is designed to reach the Congressionally mandated objective of leasing two million acres of NPR-A by August of 1982.

All future proposed activities to occur on any NPR-A oil and gas lease (including those from the first sale) must follow permitting procedures shown in Table I.

Table I
Permitting Procedures for Future
Oil and Gas Activities

1. An applicant submits description of a proposed operation to the appropriate agency:

2. The proposed activity is considered in the Federal, State, and/or local permitting processes:

   a. Public/interagency comments sought and considered.

   b. A NEPA environmental analysis is (Federal permits) performed for all phases of the applicants plan on a site-specific basis.

   c. Any required stipulations/special operating conditions are formulated.

   d. All agencies interact with the applicant to discuss the proposed activities.

3.	Proposed Action/APPROVED	or	Proposed Action/DENIED
4.	Start work order issued, appropriate agency monitoring begins.	or	Applicant redesigns action for resubmittal or withdraws application.
5.	Rehabilitation is correctly performed.		
6.	Area returns to its highest best multiple use(s).		

To carry out an expeditious leasing program in NPR-A, future lease sales beyond the offerings from the 4.56 million cleared acres require some form of NEPA documentation before a decision to lease or not can be made. In addition,

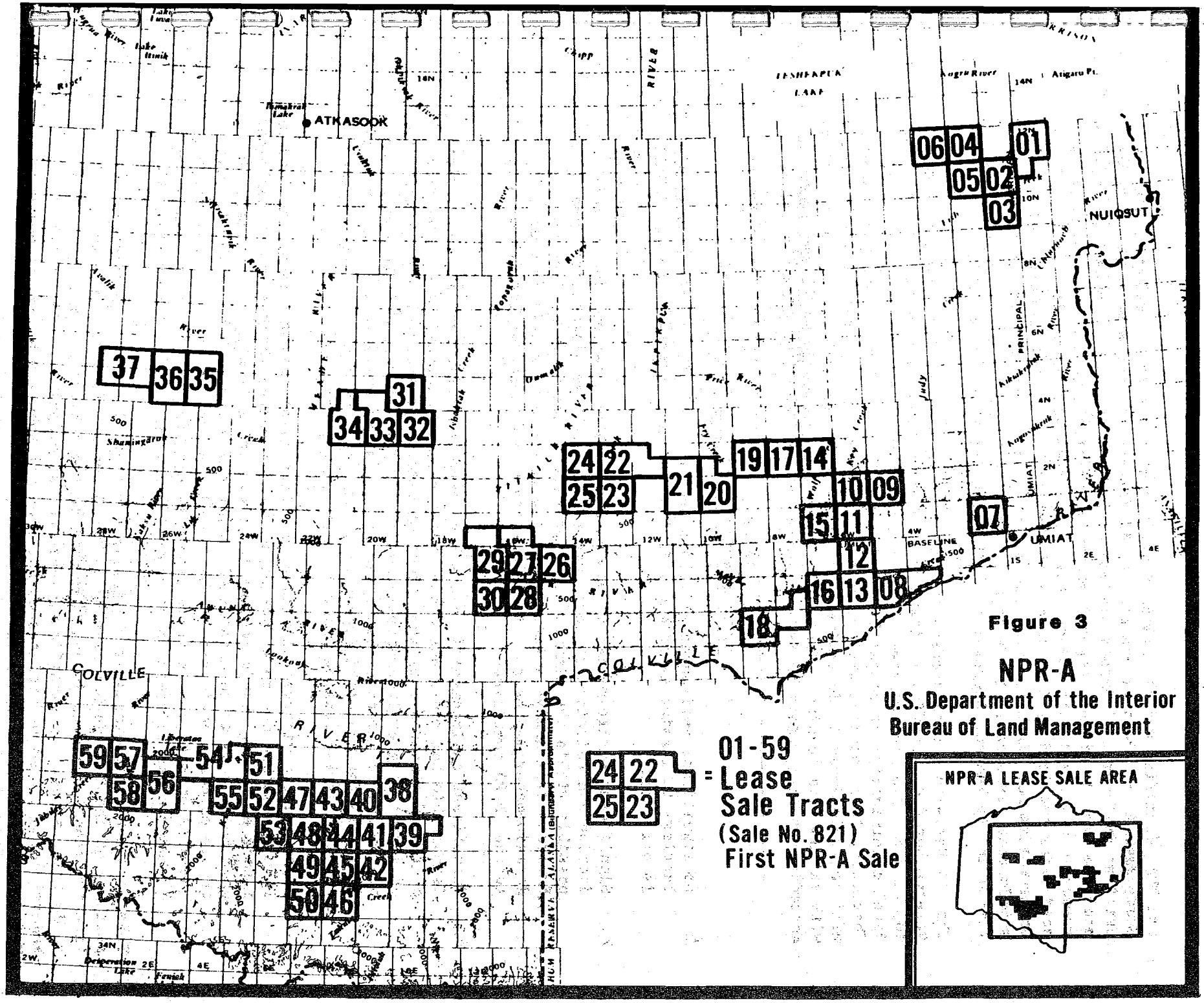

Figure 3

NPR-A

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the FEA identified and the Alaska State Director decided to delay leasing in Study Area A, F, the northern part of B, (Figure 2), and some adjacent lands until an Environmental Impact Statement (EIS) is prepared to more fully analyze probable impacts of the proposed action on critical, unique, or controversial resource values and subsistence uses. The delay will allow for additional activities required by Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA - P.L. 96-487) that affect these areas of significant subsistence resources. The Notice of Intent (NOI) to do an EIS will be published in the Federal Register on during the first quarter of 1982.

The FEA Decision Record process did not consider 17.2 million acres of the Reserve but did specifically identify 1.24 million acres (Figure 2 Areas F and top half of B) of the Reserve as requiring further NEPA consideration before final determination of compatibility/incompatibility with oil and gas leasing. Therefore, this document will be used as the vehicle for deciding which process will be implemented to determine a certain area's compatibility/incompatibility with oil and gas leasing. Table II shows how this document will evaluate according to NEPA, lands in NPR-A into one of the four land classifications:

TABLE II
NEPA Land Classifications

1. No significant environmental values and no meaningful legal or politcal barriers to leasing exist and a Finding of No Significant Impact (FONSI) is warranted.

2. Significant environmental values have been identified and impact prediction and selection of environmentally sensitive alternatives are possible within the limited scope of this document or a follow up Environmental Analysis (EA); after public comment on this document, a decisionmaker may be able to select lands available for leasing without further NEPA compliance.

3. Significant environmental values have been identified and impact prediction is possible but the lands cannot be adequately analyzed within the scope of this document due to the extent of data to be analyzed, the difficulty of formulating environmentally sensitive alternatives, and the possibility of cumulative impacts. Lands meeting the above criteria will be considered in an EIS for compatibility or incompatibility with the leasing program, and alternative leasing programs will be proposed.

4. Significant environmental values have been identified and impact prediction is not possible due to a lack of accurate resource information or analogous impact examples. Lands meeting the above criteria will be considered in an EIS as areas to be classified as presently incompatible with oil and gas development activities. The EIS will be used to evaluate and solicit comments on alternative study proposals directed at a final determination of these areas as compatible/incompatible with oil and gas development.

This document then, discusses the implications of oil and gas leasing in those portions of the Reserve not cleared in the October 1981 FEA. It also delineates those areas and issues that will be the subject of an EIS. In order to do this, a test for significance has been developed. In the phrase "major Federal action," "major" reinforces but does not have a meaning independent of "significantly" according to 40 CFR 1508.18.

Of the ten NEPA criteria for significance, those oulined in Table III are most pertinent to NPR-A:

TABLE III
NEPA Criteria Pertinent to NPR-A

(1) Unique characteristics of the geographic area such as proximity to ... wetlands ...or ecologically critical areas.

(2) The degree to which the effects... are likely to be highly controversial.

(3) The degree to which the possible effects... are highly uncertain or involve unique or unknown risks.

(4) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

(5) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by termining an action temporary or by breaking it down into component parts.

(6) The degree to which the action may adversely affect... or may cause loss or destruction of significant scientific... resources.

(7) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

(8) Whether the action threatens a violation of Federal, State or local law or requirements imposed for the protection of the environment.

Points 3, 4, and 5 that deal with ecologically critical, or controversial lands and cumulative impacts are especially germane. Some areas used by caribou, black brant and white fronted geese are critical to their life cycle. Development in such areas could be very controversial especially for subsistance harvesters. In addition, oil and gas development in the water courses proposed as Wild and Scenic Rivers such as the Colville, Utukok, and Etivluk/Nigu Rivers, would be highly controversial. These four concerns are the primary EIS issues to be analyzed.

This document is the scoping step in the EIS process. It presents to the public the BLM/NPR-A staff analysis of areas, issues, and alternatives in order that a determination of adequacy may be made from the public standpoint.

Based on these tests for significance and the others set out in 40 CFR 1508.27, the Alaska State Director has determined that leasing of oil and gas in the areas shown on Figure 4 would constitute a major Federal action and require an Environmental Impact Statement. The scoping process that will follow may change issues or boundaries.

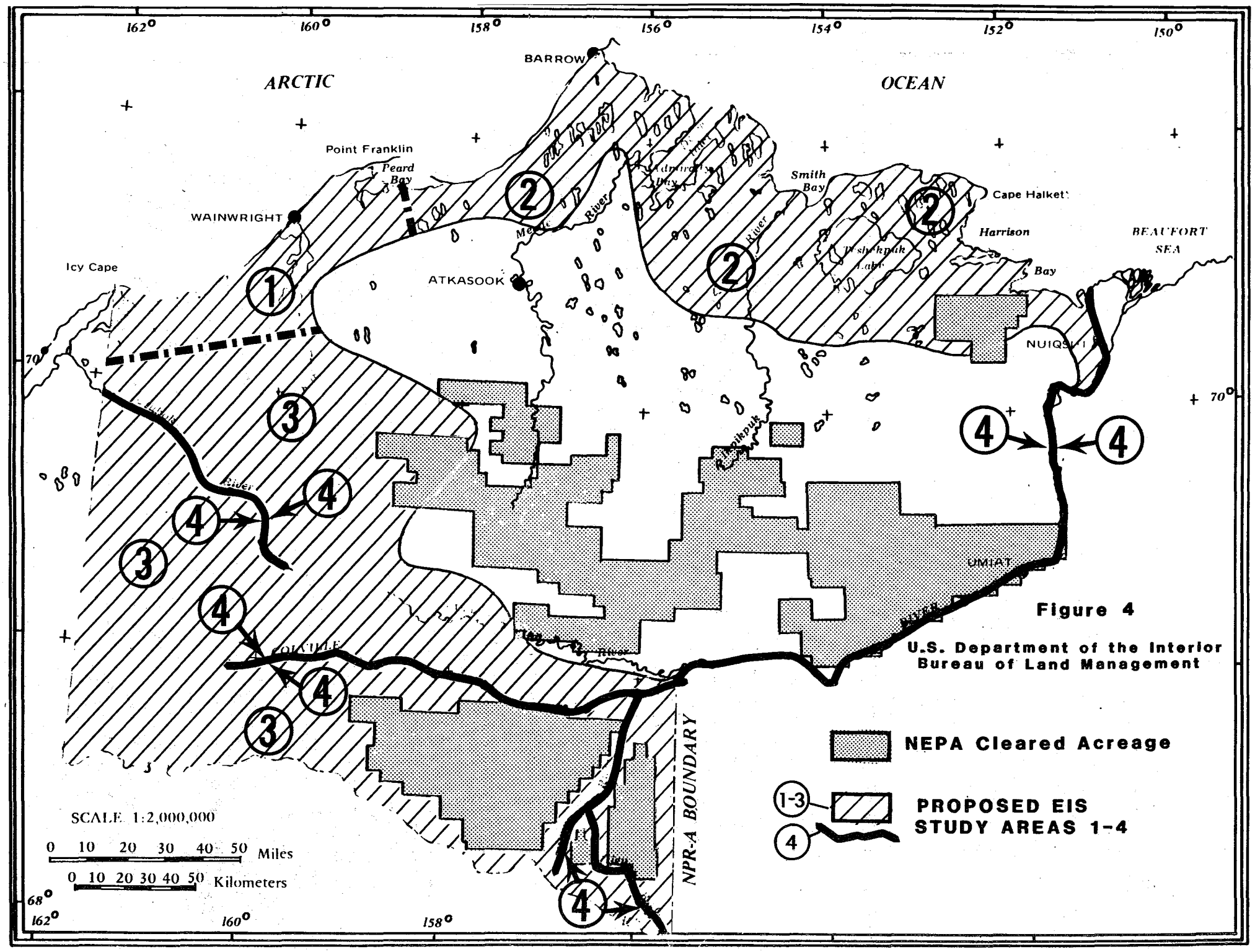

Figure 4

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The conclusion of the NPR-A staff is that all lands not already cleared in the FEA fall either into land class 2, 3, 4, of Table II. Class 2 lands may be leased without an EIS if this scoping process indicates that the significant values found on these lands would not be adversely affected by oil and gas development (using an EA to satisfy NEPA).

B. Probable Environmental Impact Statement Issues

1. Analysis of NEPA Significance for Biological Resources

The following analysis of National Environmental Policy Act (NEPA) significance consider those biological resources characterized as representative of NPR-A in the 105(c) Land Use Study (NPR-A Task Force, 1978). The NEPA Test for Significance found in 40 CFR Part 1058.27 has been performed for each representative species. The NEPA significance test is related to key species in NPR-A in the following discussions. Anticipated impacts on some species were determined not to be of NEPA significance (Section C). The NEPA test of significance is summarized in the text discussion for those species.

Figures 6 through 12 show the areas on NPR-A where the expected impacts of oil and gas development may meet the NEPA significance test for noteable biological resources. Figure 5 is a composite map showing all areas on NPR-A with biological values that may require further NEPA compliance before additional areas for leasing can be identified. In large areas of NPR-A the caribou of the Western Arctic Herd (WAH) are the only biological resource which may meet the test of significance.

The reaction of the WAH to leasing and any resultant oil and gas development may be the key issue of NEPA significance within NPR-A. The WAH and the much smaller Teshekpuk Lake "resident" herd (termed the "TLH" for this discussion) collectively use all of NPR-A. Unlike other biological values within NPR-A that lend themselves to habitat or density mapping and site or area specific protective mitigation, caribou are found throughout NPR-A during their annual cycle of migration. The herds immediate and long-term reaction to development is difficult to predict and the design for effective mitigation for them is extremely difficult.

The primary purpose of the biological resources portion of this document is to determine, based on existing literature on the WAH, other NPR-A resources, and any valid analogous examples of caribou or other species' reactions to anticipated activities in NPR-A, this section of the document will determine whether: (1) there is adequate information to predict impacts and, therefore, (1)(a) to divide the Reserve into areas where impacts would not be of NEPA significance (no EIS required) and (1)(b) into areas which must receive NEPA consideration; or, (2) information is not available on which to base prediction of impact and further research and analysis of the interaction between caribou and other species and oil development is needed to "do" the NEPA required impact analysis (no leasing decision can be made as NEPA can not be satisfied).

Preliminary analysis for this document depicted in Figure 5 indicates that all of NPR-A is in the area which may be of NEPA significance to the WAH and TLH. At this stage of analysis of possible impacts on caribou from the expansion of the currently leaseable portion of NPR-A, it is only possible to identify areas where greatest impacts would probably occur and areas where the lesser impacts would probably occur. Greatest impacts are anticipated from any

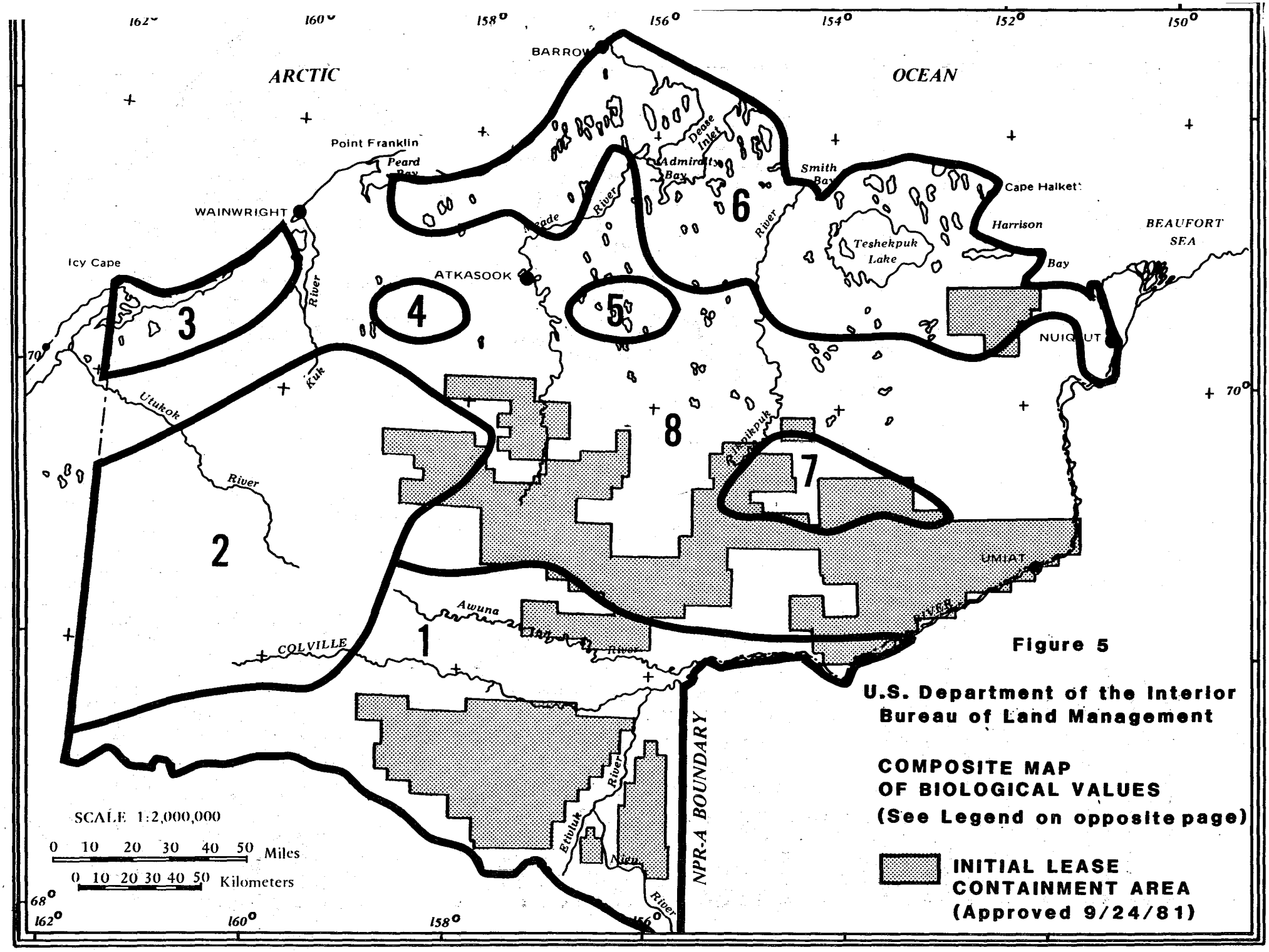

Figure 5

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COMPOSITE MAP
OF BIOLOGICAL VALUES
(See Legend on opposite page)

INITIAL LEASE
CONTAINMENT AREA
(Approved 9/24/81)

development in the WAH calving grounds in the Utukok Uplands. Lesser impacts are anticipated from leasing and development in either the summer-winter, summer, and migratory use "zones" shown on Figure 6. Least impacts would be expected from leasing at the periphery of the summer use zone where there is no other significant use by other species and where caribou use is the least since the periphery is the greatest distance from the center of use, the calving "zone".

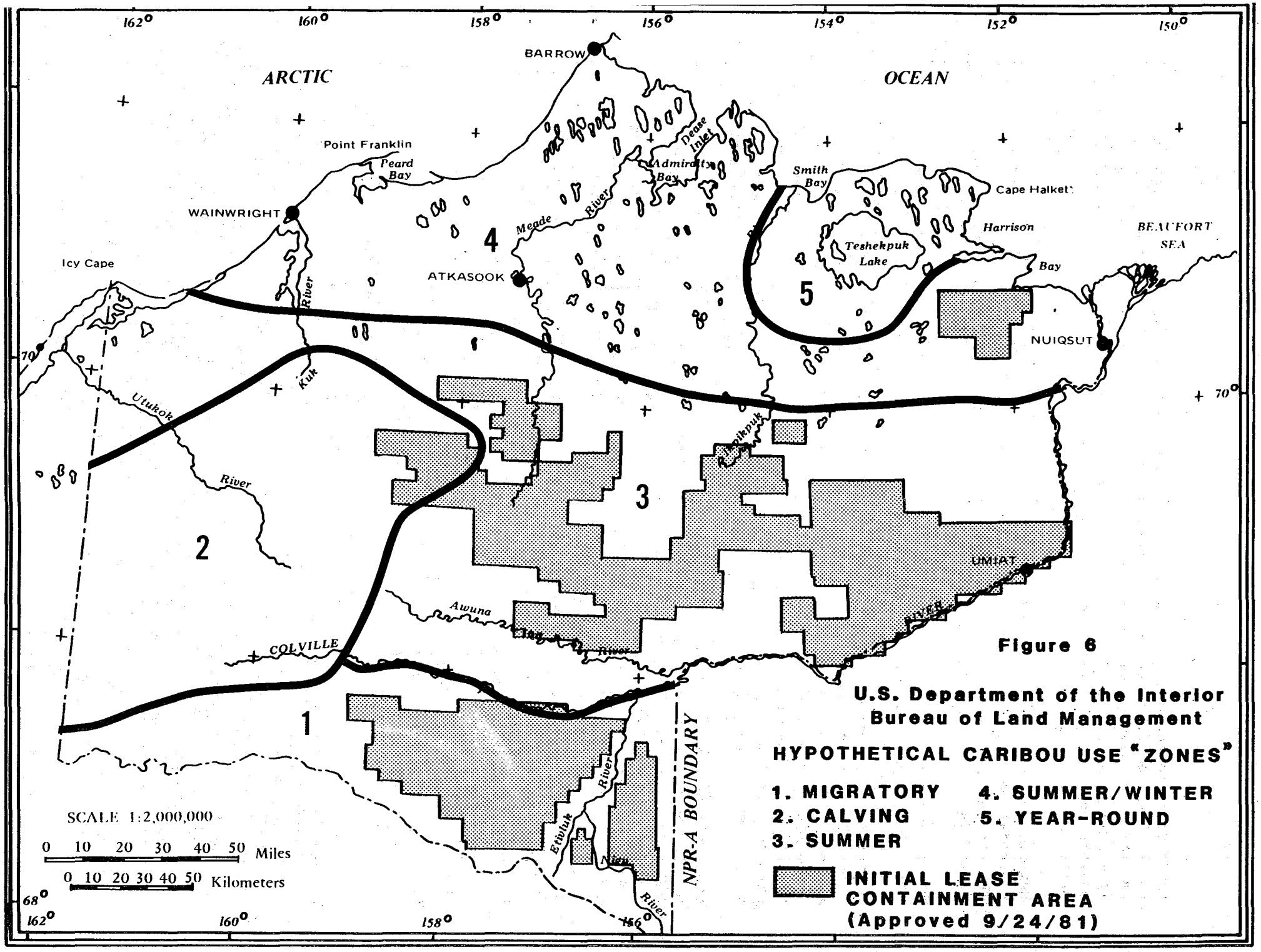
However, none of these preceding "greatest, lesser and least" impacts can presently be quantitatively or qualitatively discussed with any precision. This is due to the lack of valid analogous examples of actual caribou reaction to similar developments elsewhere.

The recently concluded Federally managed exploration program in NPR-A proved that oil and gas exploration activities do not pose any significant threat to the caribou of the WAH, "TLH", or other biological resources as long as the proper stipulations are formulated and enforced, and winter operation is stressed rather than year around operations. It also appears that well planned and regulated summer seismic geophysical operations, such as the oil industry sponsored program completed in 1981 on NPR-A, do not pose any significant threat to caribou or other biological resources as long as the importance of minimal disturbance is observed. Therefore, few, if any, exploration activities should require more than site and/or activity specific NEPA compliance.

However, the WAH, "TLH" and other biological resources of NPR-A have never confronted any permanent oil and gas development in the interior of the Reserve. NPR-A has no roads, pipelines, or heavy air traffic except on the coastal periphery of the Reserve or at Atkasook and Umiat. Impacts of development are likely to approach NEPA significance for some biological resources of NPR-A.

Figure 5. Legend: Composite Map of NEPA Significant Biological Issues

1.	Caribou Mitigration Grizzly Bear Dall Sheep	5.	Caribou Summer-Winter Range Geese
2.	Caribou Calving (Ukukok Uplands) Grizzly Bear	6.	Caribou Summer-Winter Range Caribou Year-Round Range Geese (including Teshekpuk Lake Goose Molting Area).
3.	Caribou Summer-Winter Range Dabbling Ducks Diving Ducks Shorebirds	7.	Caribou Summer Range Dabbling Ducks
4.	Caribou Summer-Winter Range Geese Dabbling Ducks	8.	Caribou Summer Range Caribou Summer-Winter Range



Source: (NPR-A Task Force, 1978)

The preliminary NEPA analysis performed for this document questions whether development impact on the WAH and TLH of NPR-A can be predicted by using the case history of the reaction of the caribou of the Central Arctic Herd CAH to the developments of Prudhoe Bay, Kuparuk and the Dalton Highway/TAPS Corridor. The validity of using the CAH as an analogous example to the WAH has been questioned repeatedly during past NPR-A studies. However, the most recent question of validity was raised in a draft publication (U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, 1981) dealing with expected impacts on the Porcupine herd in the Arctic National Wildlife Refuge:

> Comparisons between the Prudhoe Bay - CAH situation may be of only limited value in predicting the effect of an oilfield development [i]n the study area. The Porcupine herd may have different behavioural characteristics from the CAH.

This also may be true for a comparison to the WAH which moves through most of northwestern Alaska, while the CAH does not migrate far from the Coastal Plain.

Leasing additional acreage in NPR-A beyond the initial 4.56 million acre FEA area may lead to concurrent development in several areas of the Reserve. This could lead to impacts on biological resources becoming cumulatively significant (see Significance Test 5 above). Determination of cumulative significance will depend largely on the portion of NPR-A under consideration.

Expansion of the leaseable area in southern NPR-A probably would yield the greatest liklihood of producing cumulatively significant impacts. The diversity of wildlife values in the area south of the Colville River has been recognized in all previous NPR-A studies. The initial lease containment area already may have encompassed the largest amount of acreage that could be made available there without the risk of cumulative impacts. Until parts of this area are (a) explored, (b) found to have no potential, and/or (c) relinquished; additional leasing may not be possible without cumulative impacts. Additional leasing in this area may best be conducted under a phased leasing alternative.

Other areas of NPR-A, particularly the summer use "zone" of the WAH, may be leaseable under the same conditions used for the initial NPR-A leases if the threshold level of cumulative impacts could be established. It may be necessary to form panels of experts to conduct a Delphi Process to indicate areas where potential cumulatively significant and other impacts could be identified as minimal.

In at least two areas of NPR-A the biological resources may be so highly valued by the public that any leasing program that grants definite development rights within the lease would lead to great controversy (see NEPA significance Test 2 above). These two areas are the Utukok Uplands, the main calving grounds of the WAH, and the Teshekpuk Lake goose molting area. Expected impacts from oil and gas development within these areas are discussed in the following analyses of caribou and geese values.

a. Caribou

Caribou use all of NPR-A. The Reserve comprises about 25 percent of the total area in Northwestern Alaska that has been occupied by the WAH in the past two

decades. Almost all of the calving zone, the major summer range, and a significant portion of the winter range lie within the boundaries of NPR-A. (Unless otherwise noted, the following information is from NPR-A Task Force, 1978).

Because there is no portion of the Reserve that is not used by the WAH in some years, designation of specific areas with precise boundaries "for caribou" is not a feasible or a particularly useful approach when trying to predict caribou use patterns for each year's cycle. However, NPR-A can be divided into hypothetical "zones" according to the nature and timing of major caribou use during most years. These zones then can be utilized to assess the significance of effects stemming from oil and gas development on the WAH.

Migratory Use Zone

As can be seen in Figure 6 the migratory use zone lies in the southernmost part of NPR-A. This zone is used primarily by caribou moving along either east-west or north-south axis in large groups, depending on the year and season.

Spring (pre-calving) movements may entail large numbers of caribou moving east-to-west through the zone or entering from the southern passes and moving westward.

Following calving, in the second half of June or first week of July, there is in many years a west-to-east movement involving most of the WAH in dense aggregations near the crest of the De Long Mountains on either side. Groups then usually swing north to the summer use zone.

In August or September, caribou cross the Colville River and move through this zone in a north to south pattern to return to the Noatak winter range.

Other use is limited to scattered caribou use of the Colville drainage in winter, use by males and yearlings during the calving period, and summer range use.

Calving Zone

Ninety percent or more of the calves of the WAH are born in a period from about May 24 to June 12. The calving zone designation is an attempt to "map" the area where the concentration of calving has been greatest during the two decades of observation. In other words, the calving zone shown will contain the greatest concentration of calving in most years although in some years calving may occur outside this zone.

Summer Use Zone

This zone can contain 50 percent or more of the WAH during July and August. Distinct dispersed movement of animals to and from coastal areas occur. Caribou are widely dispersed into small groups within this zone. When large numbers of caribou winter on the coast, the zone is important for pre-calving migration which proceeds mainly in a south or south-westerly orientation along generally undefined corridors. Some winter use may occur in some years.

Zone of Winter and Summer Use

Usually more than 10 percent of the WAH winters north of approximately 70° latitude. Summer occupancy of this zone is low but occasionally large, dense concentrations of caribou seeking relief from insect pests are spotted along the coast.

Zone of Year-Round Occupany

The area around Teshekpuk Lake is an area occupied by caribou throughout most of the year. Calving occurs in this area and has lead to the hypothesis that the "Teshekpuk Lake Herd" ("TLH") should be considered as distinct from the WAH.

As mentioned in the introduction, impacts on caribou, especially the WAH and "TLH", are difficult to assess. There is no analogous example and the role of caribou habituation to new activities in final attenuation of the significance of impacts is not clearly understood.

It is known that caribou utilize all of NPR-A as habitat. Dr. Peter C. Lent, a noted caribou expert states:

"...the large, highly mobile caribou populations of the Arctic regions must not be considered able to withstand impacts of development because of the vast land mass they occupy. On the contrary, they are able to obtain high numbers only by long energy-consuming movements to and from specific areas that provide optimum conditions at specific times. These areas vary from year to year. The pathways of movement represent highly vulnerable "life-lines", essential for their well-being. The situation is analogous to and has the potential for proceeding in a similar fashion as the situation with the large, mobile mammals of the African savanna. In many areas development and restrictions to movements have resulted in fragmented small, sedentary populations, which, lacking free access to areas previously used to satisfy annual requirements, have become less productive, subject to stress mortality, and unstable." (U.S. Geological Survey, 1979).

This statement indicates that caribou must have access to all of NPR-A to maintain and even increase their present population. It poses the question of whether this possible in light of oil and gas development.

This question must be answered before the significance of site-specific disturbance, harrassment, migration deflection or avoidance reaction to a realistic model of NPR-A oil and gas development can be assessed.

In the development of a realistic model of NPR-A oil and gas development, it must be realized that only a very small part of NPR-A will be occupied by production facilities. Large blocks of NPR-A will never be subjected to more than geophysical survey. The chances of discovery of another Prudhoe Bay size field are low. However, the chances of discovery of several smaller fields are much better. Regardless of where the discoveries occur, there will be a need for haulroads and pipelines, possibly over a hundred miles long. The reaction of the WAH to these linear functions of development must be assessed to determine the effect of site specific and cumulative impacts on caribou population dynamics.

Although the reaction of the WAH to roads and pipelines is important, the more important question regarding the impacts of development is whether the WAH and the "TLH" survive at their present population level if development is permitted in the calving areas.

John W. Coady (NPR-A Work Group 3, Chapter 1, 1979) responds:

> Because the WAH is an extremely valuable resource ecologically, economically and esthetically, it seems ill-advised to risk the viability of the herd in anyway. Until more is known about the effects of development and disturbance of caribou on calving areas, and in view of Cameron's and Whitten's findings in the Central Arctic Herd, it seems wise to prohibit increased human activity and development on or adjacent to calving areas.

It is not known whether it will be possible to adequately predict impacts from leasing in the WAH calving grounds. Therefore, it may be necessary to reserve the calving grounds from leasing consideration until NEPA requirements can be met by adequately predicting significant impacts.

NEPA Test for Significance

1. The Utukok Uplands, the calving area for the WAH, is an ecologically critical area for caribou.

2. Any effects on caribou are likely to be highly controversial.

3. The specific reaction of the WAH to development in NPR-A is uncertain; allowing development in the Utukok Uplands presently involves unique or unknown risk to the continued success of WAH calving.

4. Any decision regarding the WAH will set a future precedent for similar decisions on the Porcupine Herd to the east of NPR-A.

5. Allowing leasing outside of the 4.56 million acres presently identified for leasing may present significant cumulative impacts.

6. The WAH has been the subject of long-term population studies. Loss or destruction of any part of the WAH may be loss of a significant scientific resource.

7. Caribou are neither endangered nor threatened.

8. Violation of laws imposed for the protection of the environment will not be tolerated.

The possibility of cumulative significant impacts on caribou from NPR-A development is always present. There is only a slight chance that significant cumulative impacts would result from the expected scattered small developments in the initial lease area. Lease stipulations prohibiting interference with caribou movements should mitigate the impacts of initial developments.

However, expansion of the original lease containment area will require consideration of possible cumulative impacts because the possibility of such impacts should be proportionate to the amount of land leased since all of NPR-A is caribou habitat.

b. Other Biological Resources

The impacts on the following species may or may not be of the great signficance. Public and government input during the scoping process will aid in making the determination.

(1) Dall Sheep

At present, only the southernmost portion of NPR-A near the crest of the De Long Mountains has been identified as Dall sheep habitat (Figure 7). The majority of sheep habitat is known to be in the Noatak drainage to the south of NPR-A with extension into NPR-A that is probably peripheral range. However, little is known about this population's reproductive rate, survival, mortality, and population levels and trends.

Dall Sheep are sensitive to disturbance by humans, especially low-level flights of aircraft. This sensitivity was recognized in the initial selection of the leasable area in southern NPR-A which exluded all but a small portion of NPR-A's potential Dall sheep habitat. However, selection of additional areas for leasing near the crest of the De Long Mountains must be analyzed carefully to avoid potential impacts. This analysis may necessitate a study to further define the limits of the Dall sheep habitat within NPR-A and the sheep's reaction to oil and gas development.

NEPA Test for Significance

1. It is not known if the potential Dall sheep habitat on NPR-A represents an ecologically critical area.

2. Effects on Dall sheep from designating leaseable areas within their range may be controversial since impacts cannot be adequately predicted with the current level of resource information.

3. Because resource information on NPR-A Dall sheep populations is so limited, uncertain, and unique/unknown risk may be possible.

4. Designating additional lease lands within Dall sheep range without adequate resource data could set a precedent for future decisions based on inadequate resource information.

5. The significance of cumulative impacts is unknown due to lack of resource data.

6. No known scientific resources related to Dall sheep would be lost or destroyed.

7. Dall sheep are neither endangered nor threatened.

8. Violation of laws imposed for the protection of the environment will not be tolerated.

(2) Grizzly Bear

The history of grizzly bear has been one of continuous reduction of numbers and range coinciding with human population growth and development. In NPR-A,

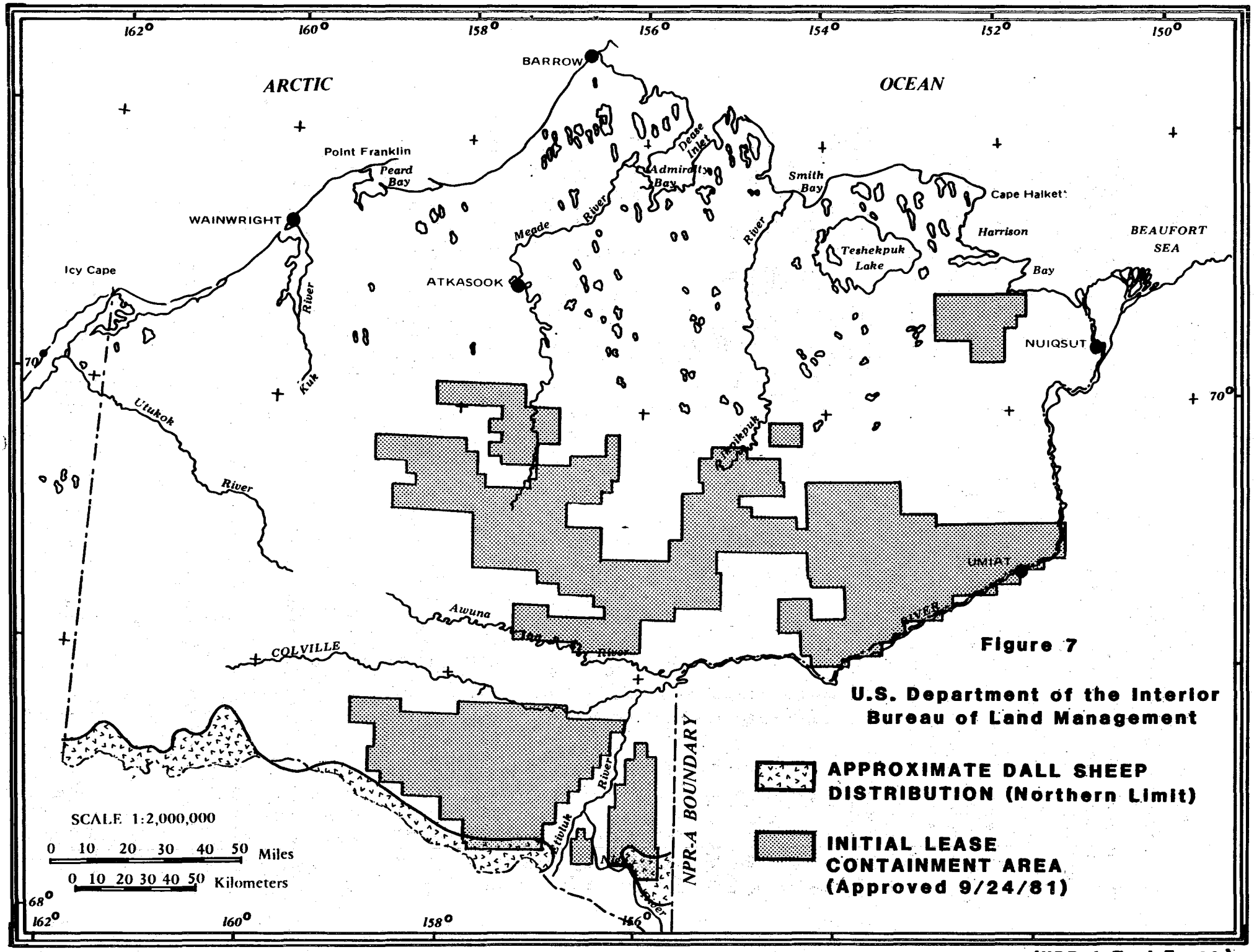


Figure 7

U.S. Department of the Interior
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Source: (NPR-A Task Force)

the grizzly is at the northernmost extent of its range; the period of food availability during the summer is short, reproductive potential is low, the area required for individual home ranges is large, and the stunted vegetation of the region provides little cover (Reynolds, 1979).

Concentrations of people and solid wastes in areas of bear use often form attractive nuisances and result in habituated bears that are shot or removed because of human-bear conflicts. Because of inevitable, bear-man encounters, development in an area effectively excludes normal bear use and will result in reduced overall numbers (National Petroleum Reserve in Alaska Task Force, 1978). Because grizzlies in NPR-A travel widely and have large home ranges, maintenance of enclaves of intact habitat is important; these should be at least as extensive as 2,000 square miles (Reynolds, 1979).

Grizzly bear distribution on NPR-A ranges from one per 300 square miles on the Coastal Plain to approximately one per 20 square miles in the Utukok Uplands. (Figure 8). The Utukok Uplands supports the greatest density of grizzlies on the North Slope apparently because of the area's use as the caribou calving grounds of the WAH.

Grizzly distribution of on NPR-A was given considerable weight in the process leading to the selection of the initial areas for leasing. No areas were selected in the Utukok Uplands because of WAH use and high grizzly densities. Leasing in areas on the Coastal Plain were thought to offer insignificant environmental risk to the NPR-A grizzly population. However, areas chosen for leasing in southern NPR-A were analyzed on the basis of maximum industry interest as well as and the maximum acceptable environmental risk to grizzlies. Selection of additional lands for leasing in southern or southwestern NPR-A must consider the possibility of cumulative impacts on grizzlies.

NEPA Test for Significance

1. The Utukok Uplands support the greatest density of grizzlies on the North Slope. This area may be ecologically critical to survival of the NPR-A grizzly population should the remainder of NPR-A be leased.

2. Oil and gas development effects on grizzlies in the Utukok Uplands may be controversial.

3. There may be unique and/or unknown risks involved when considering the effects of oil and gas development on grizzlies. The level of development may not be directly proportional to the degree of impacts on grizzlies because of their attraction to garbage and the possibility of their elimination to ensure public safety.

4. Selection of additional areas for leasing in southern NPR-A without consideration of possible cumulative impacts may represent a decision in principle for exceeding a previously established level of acceptable environmental risk without further documentation.

5. Oil and gas development under current stipulations within the initial lease areas is not likely to produce significant impacts on grizzlies at the population level. However, selection of additional areas for leasing in southern NPR-A may result in as yet unconsidered cumulative impacts.

6. Oil and gas development in the Utukok Uplands may disrupt a previously studied high density grizzly population before a followup study could take place.

7. The grizzly bear is not endangered or threatened in Alaska.

8. Violation of laws imposed for the protection of the environment will not be tolerated.

(3) Polar Bear

Use of terrestrial habitats by polar bears within NPR-A is limited to the period from October through April when females seek denning habitat. Optimum denning areas are determined by the location of suitable snow drifts within the zone extending up to 20 mi (30km) inland from the coast. The area known to have significant denning use is shown on Figure 9.

Conflicts involving potential NPR-A land uses and optimum polar bear management could be numerous. Increasing human activity and developments in the coastal zone during winter, including surface travel, construction of temporary and permanent camps, and the removal or modification of snowdrifts suitable for maternity denning could lead to significant loss of on-land denning habitat or could interfere with freedom of movement to or from the denning areas. Camps and their associated solid waste can constitute an attraction leading to bear-human conflicts.

Within the initial lease areas, only a few tracts to the southeast of Teshekpuk Lake intersect areas that have possibly significant denning habitat. Extension of leasing into other parts of the denning habitat may not be prudent until further analysis is performed to better define both potential denning habitat and effective mitigation.

NEPA Test for Significance

1. It is not known if the polar bear maternity denning area shown on Figure 9 an ecological critical area to the total Arctic polar bear population.

2. Given the present knowledge of polar bear use of coastal NPR-A, leasing in coastal areas may be controversial.

3. There may be uncertainty in leasing the coastal areas of NPR-A without intensive mitigative analysis.

4. Leasing additional areas of coastal NPR-A without further mitigation analysis may represent a decision in principle about other leasing decisions.

5. The relevance of cumulativly significant impacts to polar bears from additional leasing in coastal NPR-A has not been determined.

6. No known scientific resource related to polar bears would be either lost or destroyed.

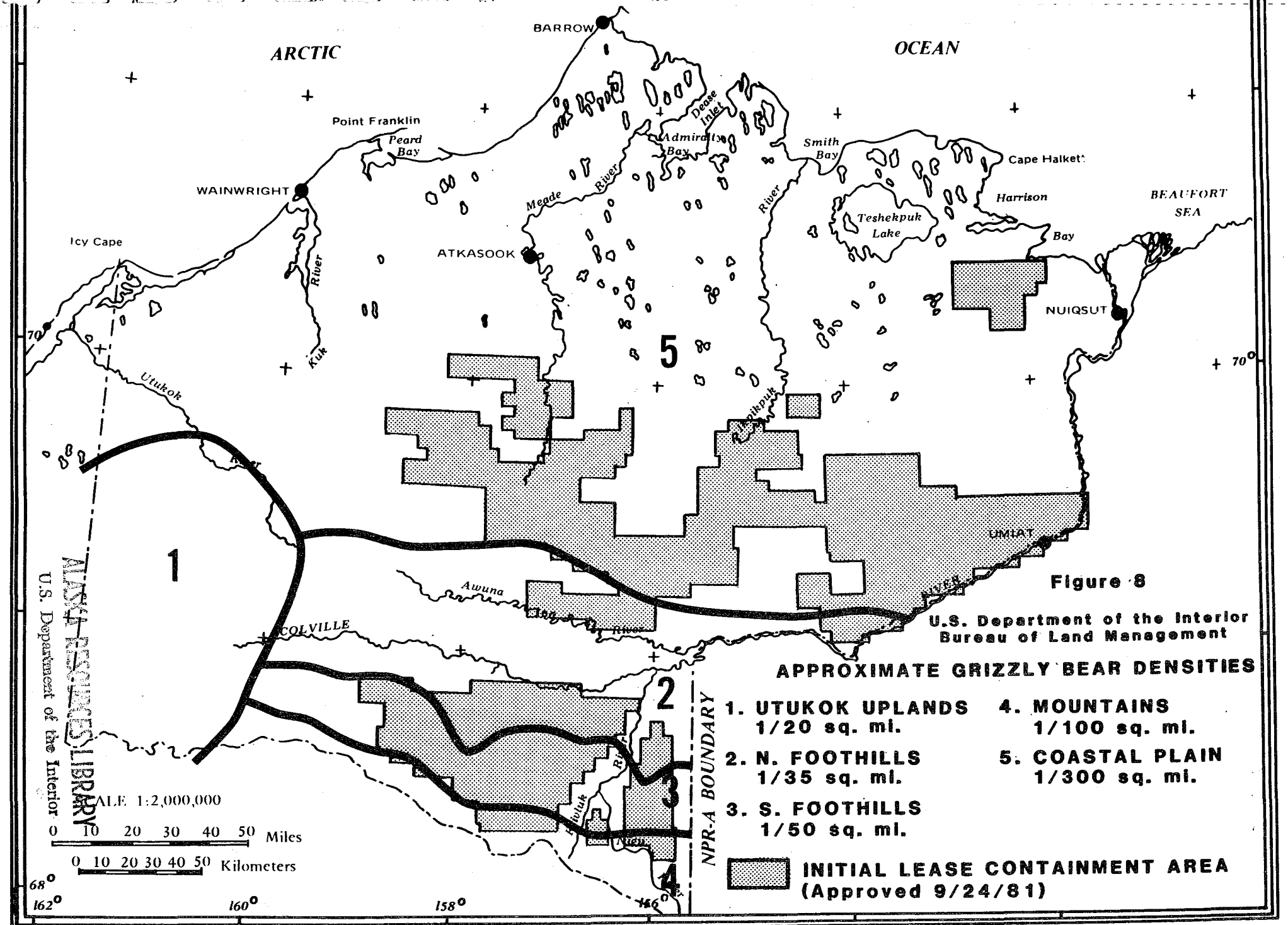

Figure 8

ALASKA RESOURCES LIBRARY
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Source: (NPR-A Task Force Force, 1978)

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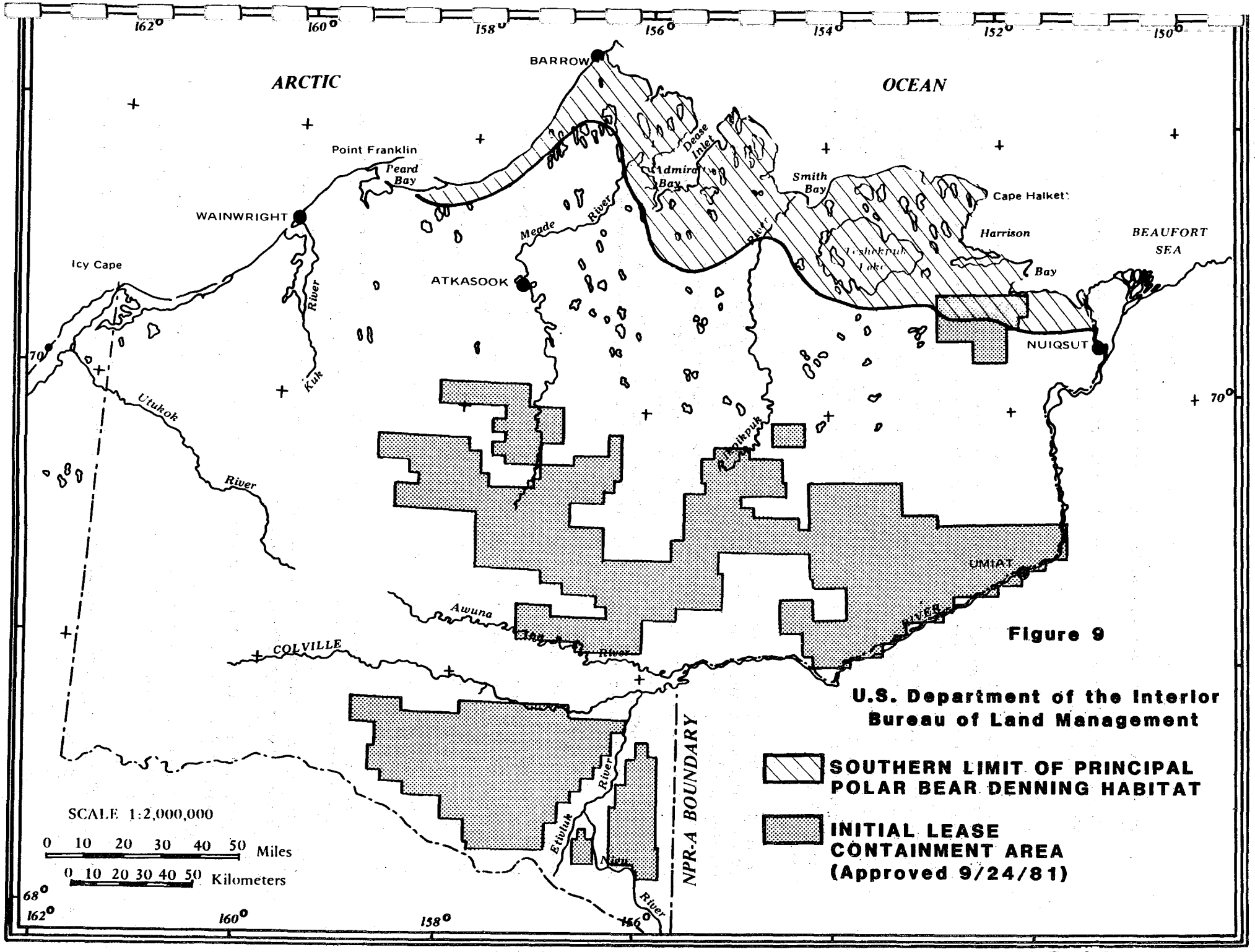

Figure 9

U.S. Department of the Interior
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Source: NPR-A Task Force, 1978

7. Polar bears are neither endangered nor threatened

8. Violation of laws imposed for the protection of the environment will not be tolerated.

(4) Shorebirds

Shorebirds such sandpipers, plovers, phalaropes, dowitchers, dunlin, godwits, whimbrels are distributed throughout NPR-A except in the southernmost portion. Highest densities of shorebirds occur within a zone up to 20 miles (30km) from the coast. Evidence indicates that wetlands surrounding river delta systems may be more productive breeding areas than other portions of NPR-A. Many different types of shorebirds are dependent on the wet tundra of the Arctic Coastal Plain for breeding. NPR-A encompasses a significant portion of this habitat type within Alaska. Large shorebirds (godwit, whimbrel) appear to be most abundant in the Northern Foothills. The coastal shoreline is very important for late summer pre-migration staging as are the large lakes to the north of Teshekpuk Lake.

In most of NPR-A, site-specific stipulations will be adequate to protect shorebird populations from activities that destroy or disrupt their nesting or feeding habitat. The expected scattered distribution of oil discovery will undoubtedly leave large blocks of the coastal zone undisturbed and available for low density use of shorebirds. However, several areas of NPR-A (Figure 10) support such high densities of shorebirds as over 400 per square miles that development may have disportionate impacts on populations. Further analysis of probable impacts and possible mitigation may be warranted in these areas.

NEPA Test for Significance

1. The areas shown in Figure 10 support such high densities of shorebirds that they may represent ecologically critical areas.

2. Activities in high density shorebird habitats may be controversial.

3. Possible effects upon shorebird nesting and feeding habitats are reasonably well defined.

4. Leasing in high density shorebird habitats without intensive mitigative measures may set a negative precedent for other resources.

5. Concurrent leasing of all high density shorebird habitat may produce cumulatively significant impacts.

6. Significant scientific resources pertaining to shorebirds should not be lost or destroyed.

7. NPR-A shorebirds are neither endangered nor threatened. The Eskimo curlew, an endangered species, has not been identified on NPR-A in recent times.

8. Violation of laws imposed for the protection of the environment will not be tolerated.

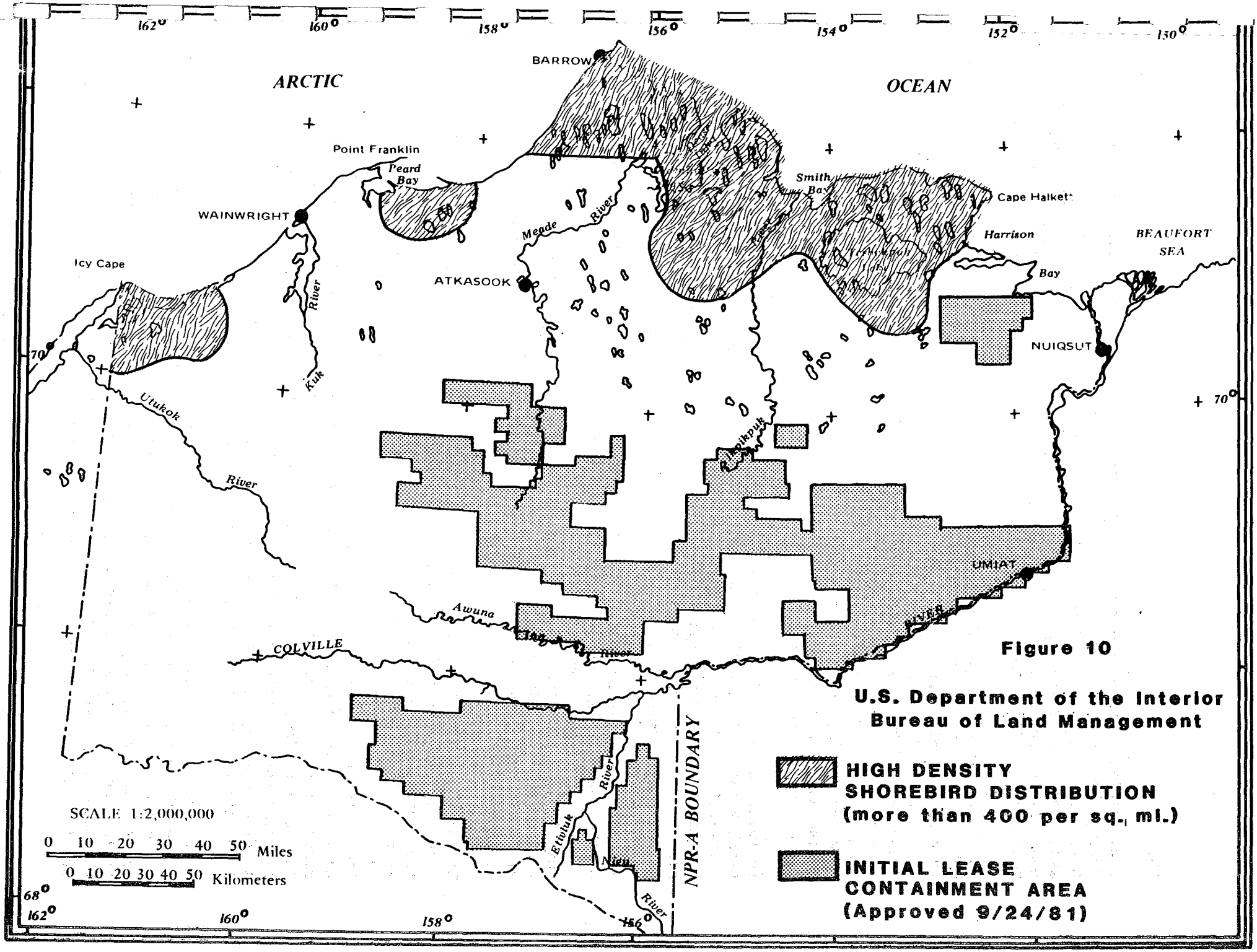

Figure 10

U.S. Department of the Interior
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Source: (NPR-A Task Force, 1978)

(5) Geese

Four species of geese are known to regularly use the Coastal Plain of NPR-A during the ice-free season: white-fronted geese (Anser albifrons frontalis), black brant (Branta bernicla nigricans, Canada geese (Branta canadensis taverneri) and lesser snow geese (Chen c. caeruelescens). Ross geese (Chen rossii) have been sighted rarely and will not be discussed further in this overview (NPR-A Task Force, 1978). Geese are a harvestable resource of national significance.

White fronted geese are the most numerous and most widely distributed goose on NPR-A. This species accounted for 59 to 97 percent of all geese observed from late June to mid-September in 1977 and from 71 to 94 percent of observations from July to September 1978. Average population levels for 1977 and 1978 were 53,900 and 47,800 respectfully. White-fronted geese generally enter the Reserve from the west in May from spring staging areas at the mouth of the Utukok River. They then travel eastward across the Reserve to the Ikpikpuk River before dispersing to suitable habitat in the Coastal Plain. In contrast to the enmass spring arrival, white-fronted geese leave the Reserve by many routes to the east, west and south.

Estimates of up to 20 percent of the total world population have been made for black brant utilizing the Teshekpuk Lake goose molting area each July (1977-22,075; 1978-32,00). The fact that brant concentrate in this area each year demonstrates its key importance to their life cycle. Black brant follow the same spring migration pattern as white-fronted geese but in the fall leave the Reserve to the west after staging in the area from Peard Bay to Icy Cape.

Bellrose (1976) estimates that between 10-20,000 Canada geese utilize portions of the Coastal Plain and Colville River drainage for breeding habitat. Canada geese usually enter and exit NPR-A through the Umiat area. He also estimates that lesser snow goose use of NPR-A for breeding is light. However, lesser snow geese do utilize the NPR-A Coastal Plain during migration and Derksen et al (NPR-A Work Group 3, Chapter 8, 1979) noted some use of the Teshekpuk Lake goose molting area.

No large goose nesting colonies exist in NPR-A. However, several areas (see Figure 11) support high densities of geese. The most important goose area is the Teshekpuk Lake goose molting area which is an extremely concentrated use area for both goose nesting and molting (NPR-A Task Force, 1978).

Goose useage of NPR-A can be adequately protected outside of the high density habitats by the application of permitting stipulations. Low to moderate density areas of goose use should experience impacts in direct proportion to the level of development. The effectiveness of mitigation or permitting stipulations on these impacts should also be directly proportional to the level of development and should have insignificant impact at the population level given a realistic projection of oil discovery in NPR-A.

Stipulations for leases or permits in high density goose habitat are much harder to derive. Derksen et al (NPR-A Work Group 3, Chapter 8, 1979) has recommended that the Teshekpuk Lake goose molting area should have complete protection from all exploration and development activities. Protection must include coastal wetlands, bays, lagoons and stream deltas. Obviously these high density goose areas need further analysis before allowing leasing and development if hydrocarbons are present in economic quantities.

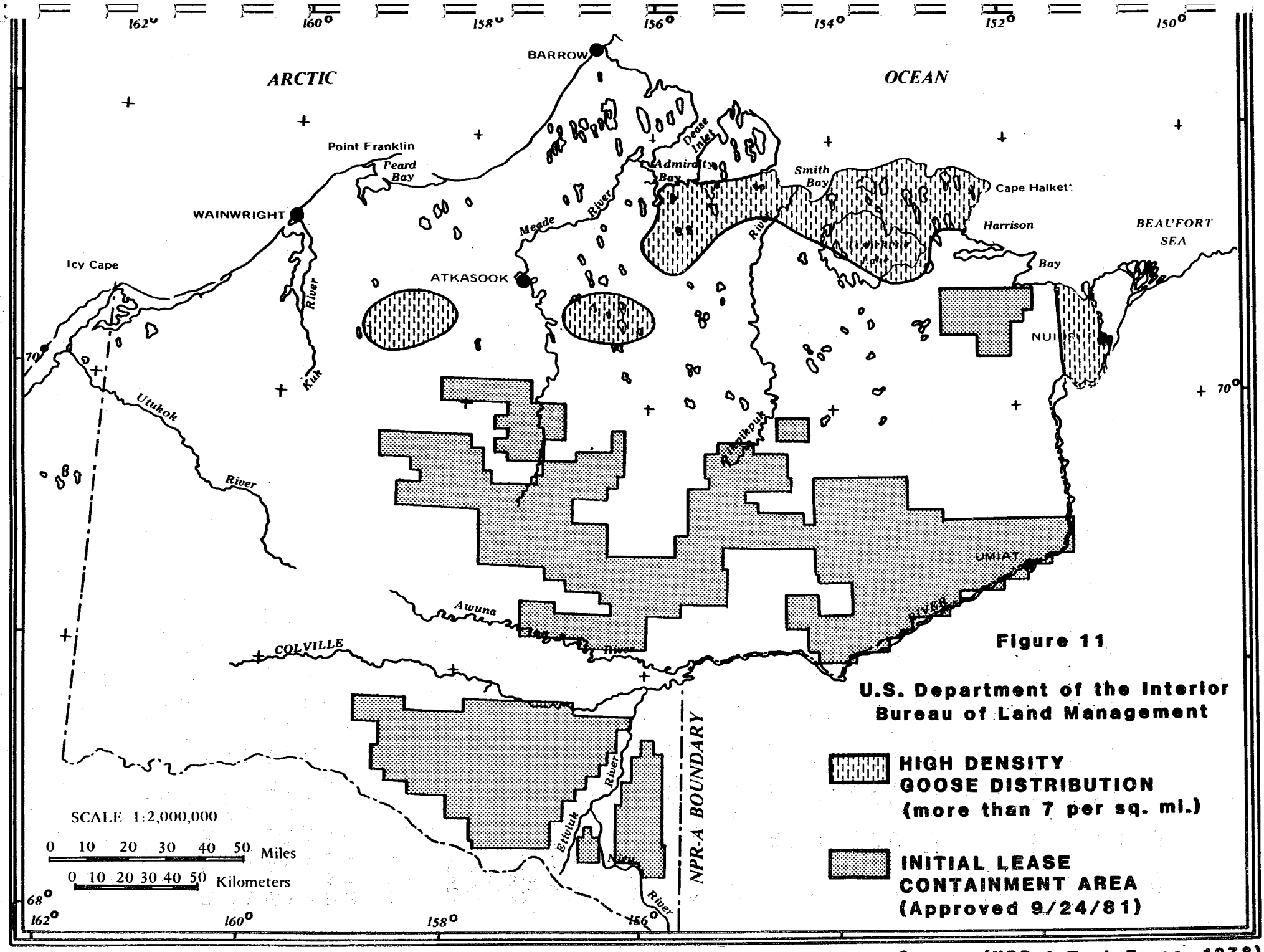

Figure 11

U.S. Department of the Interior
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Source: (NPR-A Task Force, 1978)

NEPA Test for Significance

1. The Teshekpuk Lake goose molting area is an ecologically critical area to the maintenance of NPR-A geese populations. Designation of other high density areas as critical for geese is not as clear cut.

2. Any signficant effects on geese may be controversial.

3. Leasing in areas of high goose density may present uncertain risks.

4. Any leasing in high density goose habitats before the level of acceptable risk can be determined may set a negative precedent for future decisions.

5. Leasing in several high density goose habitats simultaneously, even with highly restrictive site-specific stipulations, may produce negative cumulative impacts.

6. The Teshekpuk Lake goose molting area represents a signficant scientific study area that contains documented values that must be protected against loss or destruction.

7. None of the NPR-A geese are either endangered or threatened.

8. Violation of laws imposed for the protection of the environment will not be tolerated.

(6) Ducks

Ducks using NPR-A during the ice-free season can be divided into dabbling and diving duck groups. Among the dabbling ducks, pintails (Anas acuta) comprised 85 percent of the total dabbling duck population in 1978 with mallard (A. platyrhynchos), green-winged teal (A. crecca), baldpate (A. americana), and shoveler (A. clypeata) making up lesser percentages. Among the diving ducks, oldsquaw (Clangula hyemalis) comprised 83 percent in 1977 and 60 percent in 1978 of the total population with Steller's eider (Polysticta stelleri), king eider (Somateria spectabilis), common eider (S. mollissima), red-breasted merganser (Mergus serrator), scaup (Aythya spp.) and scoter (Melanitta spp.) making up lesser percentages. Figures 12 and 13 show areas of highest dabbling and diving duck density on NPR-A (NPR-A Task Force, 1978).

The significance of possible impacts on ducks stemming from oil and gas development within NPR-A is not easily determined. Judging from the fact that pintails and oldsquaw make up most of the breeding population on NPR-A and breeding habitat for the majority of the North American populations lie outside of NPR-A, oil and gas development impacts would have to be large to cause significant impacts at the total population level. However, all of these birds represent a harvestable resource of national significance. Other types of developments are already occurring in the Mackenzie Delta breeding area or proposed for other parts of Alaska and Canada. Therefore, the significance of impacts must be determined among the ducks using NPR-A, and effective mitigation must be designed to fit proposed NPR-A oil and gas activities.

Effective mitigation must be aimed at preserving the present quality of NPR-A prime duck habitat. Several areas of NPR-A have recieved intensive study to correlate habitat type with actual duck and other waterfowl use. Unfortunately,

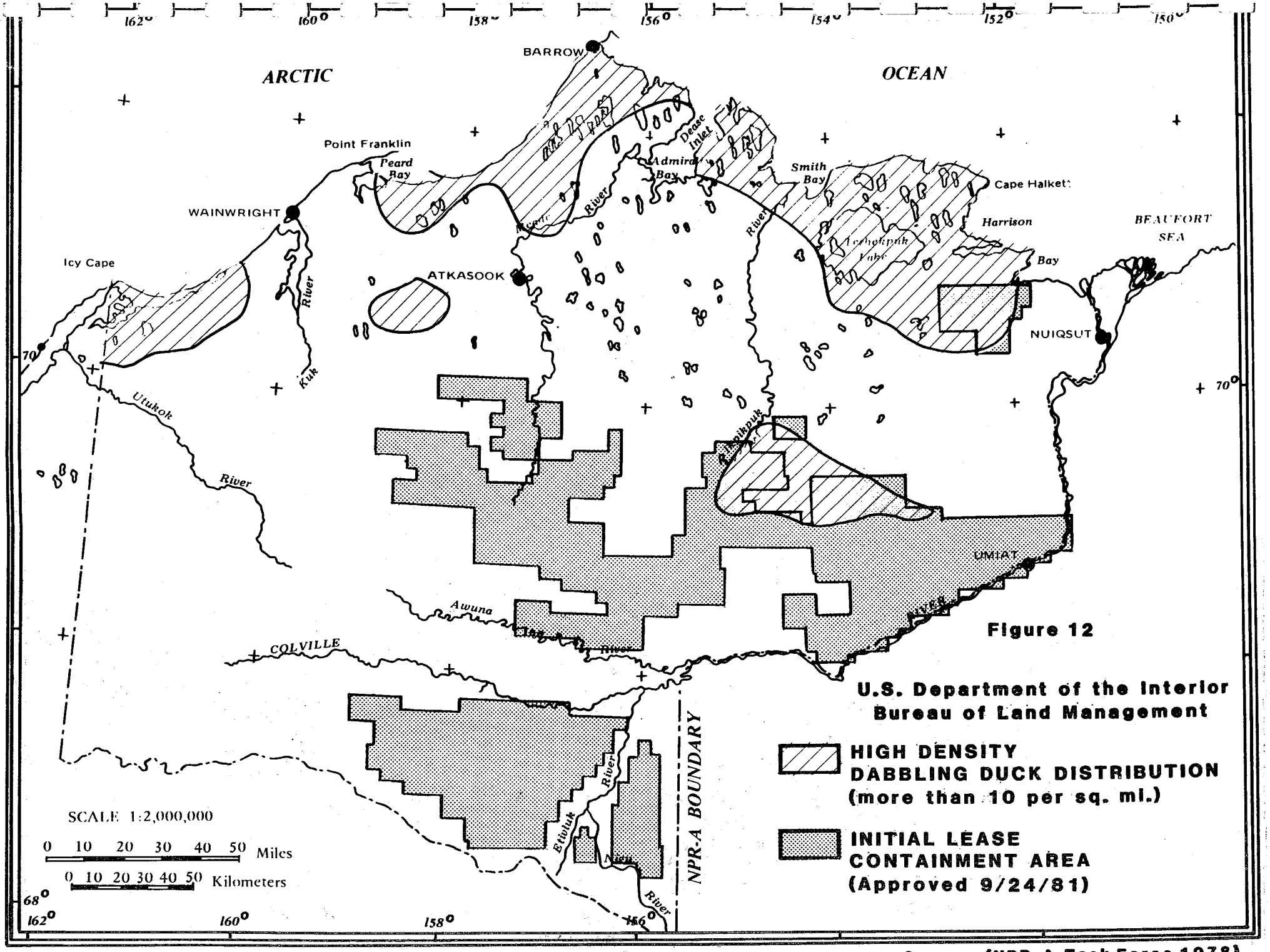

Figure 12

Source: (NPR-A Task Force 1978)

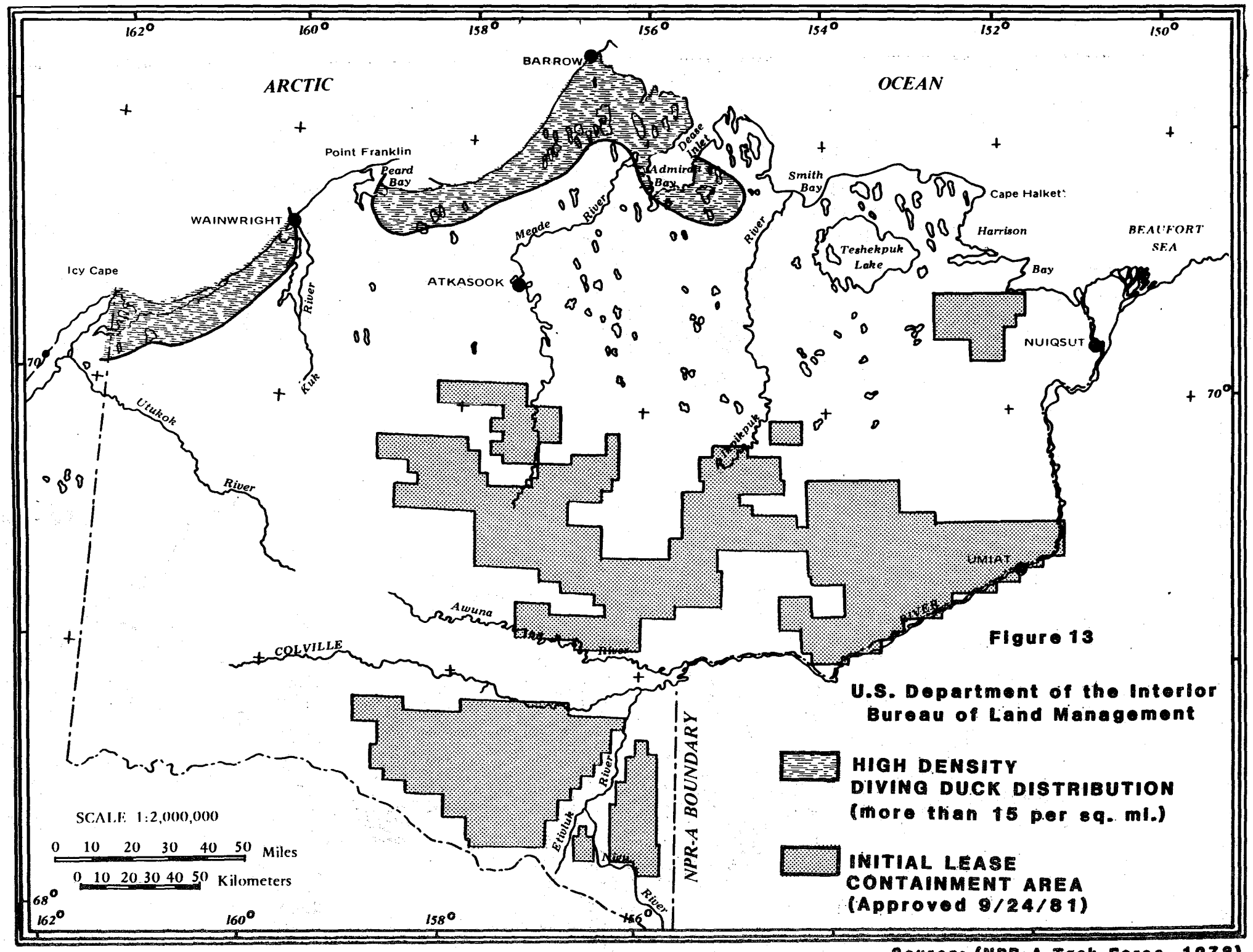

Figure 13

Source: (NPR-A Task Force, 1978)

this detailed information contained in NPR-A Work Group 3, Chapter 8, Derksen et al (1979) has not been extrapolated to cover the entire Reserve because no mapping of NPR-A's wetlands to the degree necessary has been performed. It is possible that small areas proposed for leasing could be mapped and impacts predicted on a case-by-case basis that would probably prove effective in reducing the impacts to nonsignificant levels in the majority of trials.

However, cumulative impacts may be significant. Due to the national interest in ducks, high density duck areas should recieve further analysis before allowing further lease tract delineation in these areas.

NEPA Test for Significance

1. The areas shown on Figures 12 and 13 may be considered as ecologically critical areas to NPR-A duck breeding success.

2. Significant impacts on duck breeding sucess, if any, would be controversial and of national significance.

3. Until extrapolation of known data to other parts of the Reserve can be performed, the impacts of even heavily stipulated development may be uncertain.

4. Allowing leasing in areas of high duck density before analysis of possible impacts can be performed may set a negative precedent.

5. Allowing oil and gas leasing to proceed into areas of high duck density on separate case-by-case analysis could lead to significant cumulative impacts on the NPR-A breeding population.

6. No significant scientific resources will be lost or destroyed provided intensive waterfowl habitat studies are extrapolated before any alteration of previous study areas is allowed.

7. NPR-A duck species are neither endangered nor threatened.

8. Violation of laws imposed for the protection of the environment will not be tolerated.

2. Socio-Cultural and Subsistence Issues

Energy development in NPR-A will have both beneficial and adverse effects. Through the Borough's taxing authority and in the arena of political action, Inupiat leaders will be able to exert power on behalf of the people. One such use of newly developed "power" may be taking control of the educational curriculum (to make the schools realistic training centers where students get the kinds of skills they will need given the kind of future the Inupiat believe they face). Another use of this "power" will be to create and maintain a higher level of employment opportunity for those who wish to promote their family's well being by both continuing subsistence activities and through wage employment.

Some Inupiat will use the wages they earn from NPR-A development to purchase enough alcohol and drugs to become problems within the family or village. In addition to this adverse effect, other Inupiat who long have been subsistence

hunters may experience additional stress. This may occur if they find that fewer of the young Inupiat want the harsh life of the subsistence hunter thus making the stories of the elder hunters less meaningful and leaving them without apprentices. Without apprentices they will be unable to fulfill their traditional role as the elder hunter who is also a hunter/teacher. They may also experience culture clash when, in the pursuit of subsistence resources, they enter areas historically used for hunting, fishing, or gathering only to find those areas closed to them to protect oil field development.

Other potentially adverse effects are any impacts on the harvestable resources that would decease the numbers or distribution of birds, fish, fox, caribou, etc. or any impediments to travel in traditional hunting, fishing or gathering areas such as pipelines that act as barriers to snowmachines. These twin subsistence issues, the reduction of the "supply" of harvestable resources and impediments to Inupiat movement must by Congressional mandate be separately and thoroughly analyzed.

Subsistence, the harvesting of the resources of the land or water for personal, household, village and/or ceremonial purposes, has been given Congressional protection under the Alaska National Interest Lands Conservation Act of 1980 (ANILCA). ANILCA requires all Federal agencies to recognize subsistence uses of the public land as a legitimate land use deserving extraordinary protection. That protection includes a determination of whether allowing new land uses would significantly impact subsistence. If it is found that the new land uses would significantly impact subsistence then reasonable measures must be developed, implemented, and monitored to assure that the impacts on subsistence are minimized.

Special meetings and hearings must be held in the vicinity of the area where the new land uses will be permitted to explain to rural residents how the determination of impacts on subsistence was made and to discuss and modify, when appropriate, the measures taken to reduce impacts on subsistence.

To comply with this legislative mandate, the BLM has determined that lands having subsistence resources of essential value to the residents of the North Slope will be viewed through the framework of an Environmental Analysis before leasing can occur. The three categories of lands with subsistence resources of essential value are:

(a) Coastal lands where oil and gas development might either interfere with the ability of the subsistence harvester to take marine mammals by blocking travel routes from the village to the pack ice; drive the marine mammals further to sea as they may attempt to avoid areas of industrial activity; or destroy the bay and estuary ecosystems through chemical and oil spills;

(b) Freshwater lakes and certain rivers where waterfowl are found in high densities and where oil and gas activity might either reduce the number of waterfowl or cause the waterfowl to seek out other lakes to avoid oil and gas activity. Impacts will also occur if the birds no longer overfly areas where subsistence hunters can harvest them.

(c) Critical caribou habitat the loss of which would reduce the size of the Western Arctic Herd, and through the reduction in the herd size would deprive the subsistence harvester of the critical subsistence resource of meat and hides central to Inupiat diet and clothing.

In summary, the residents of the North Slope practicing subsistence are heavily dependent on a continued supply of caribou and marine mammals. Table IV indicates the strength of that dependency. The right to continue this subsistence lifestyle has been given extraordinary Congressional protection. BLM must carefully consider impacts both on the harvestable resources shown in Table I and on the ability of subsistence peoples to continue the harvest.

Table IV
Estimated Dependence on Selected Subsistence Resources

Subsistence Resource	Annual Historical Harvest in Pounds*	Percent of Total Harvest
Marine mammals	1,300,000	51%
Caribou	1,030,000	40%
Fish or waterfowl	150,000	5%
All others (moose, dall sheep, etc.)	30,000	4%

*In the late 1970's the Inupiat were restricted as to the number of caribou and bowhead whales they could take. Our analysis is, therefore, based on the notion of the equilibrium level harvest. The equilibrium level harvest is the harvest which could adequately provide the customary and traditional diet and clothing requirements of the Inupiat. Estimates of the 1972-1976 harvest were used as the basis of the equilibrium harvest level. Limitations on the Inupiat harvest began in 1977. (Source: U.S. Department of Interior 1979)

NPR-A subsistence study zones include a coastal zone from Icy Cape to Point Franklin; a coastal zone from Skull Cliff to Smith Bay; crucial spring (calving) and summer caribou habitat in and east of the Utukok River; and crucial waterfowl and caribou habitat near Teshekpuk Lake. These four study zones are shown on Figure 14.

Areas where few harvestable resources occur and/or areas where many harvestable resources are found but are not used may be adversely affected by oil development but still not impact subsistence. Such areas exist within NPR-A. The red fox, moose, wolf and grizzly bear are only of marginal value to the subsistence culture (Table IV). A finding of no significant subsistence values is justified for these areas. If no significant subsistence values exist there, then no significant subsistence impacts would result from oil and gas development.

There are also areas of high value subsistence resources where harvesting is taking place but where experience shows that "best management practices" can be stipulated to eliminate the adverse effects of oil and gas development. These high value/mitigatable impact areas primarily are fisheries (Table IV for value of the fish harvest).

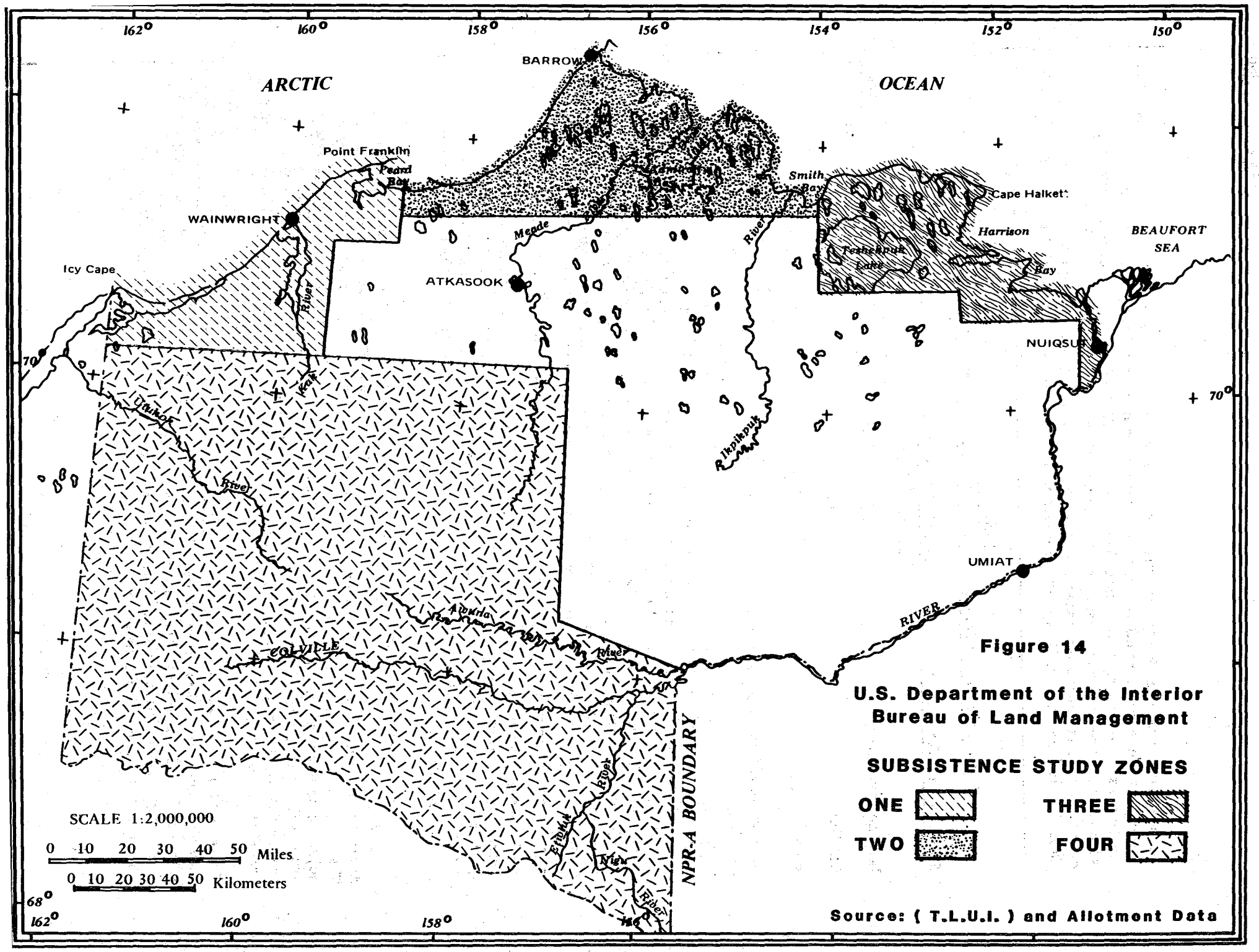

Figure 14

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SUBSISTENCE STUDY ZONES

ONE **THREE**

TWO **FOUR**

Source: (T.L.U.I.) and Allotment Data

Fisheries can be protected in two ways. First, lease boundaries can be drawn to exclude rivers and lakes with known fisheries. Under this option two leases would be issued bracketing the river or lake but stopping ¼ mile away from the lake shore or river bank. Under the second option the river or lake would be included in the lease with a no occupancy stipulation for the water area and for ¼ mile from the lakeshore or riverbank.

Both options would locate oil and gas activity far enough away from the fishery to guarantee that chemicals or spills would not enter the fishery; routes of travel of the subsistence harvester along the floodplain could be preserved (also protecting major moose and fox habitat); and campsites of the harvesters would be protected.

Given these protections, a finding of no significant impacts on subsistence may be justified for these lands.

Two analytical steps determined the boundaries of the subsistence study zones. One was to carry the majority of the traditional land use sites and native allotments to a subsistence study zone. This step is shown in Table V.

Table V
Process for Determining Subsistence
Study Zone Boundaries

Category of Subsistence Site 1/	Number in Subsistence Study Zones By Zone				Number Not in Any Study Zone
	1	2	3	4	
Allotments	125	76	15	4	54
Traditional Land Use Sites	24	15	10	32	20
Totals	149	91	25	36	74
Percent of Total	39	24	6	9	19

1/ All numbers in this Table are approximate as discussion with individual Inupiat and their leaders indicates that there are additional unrecorded sites.

If the TLUI's and allotments are a reasonable measure of hunter/gatherer distribution, then this analysis implies that the vast majority of the hunting, fishing and gathering sites may be carried forward to the EIS. (By reasonable measure we mean that unrecorded sites will also be found to be within the subsistence study zones and that the sites outside the study zones do not provide proportionally more caribou or fish harvest per site than the sites inside the study zones).

The second analytical step involved carrying all the habitat critical to caribou and all the coast lands to a probable EIS. As shown in Table I, marine mammals historically have comprised about 51 percent of the average annual subsistence harvest. Carrying all coastal lands where marine mammal harvesting may occur to an EIS appears justified.

Historically, caribou provided about 40 percent of the subsistence harvest as shown in Table I. Carrying the critical calving habitats for the Teshekpuk Herd and the Western Arctic Herd to an EIS assures that this valuable subsistence resource will also be subject to in depth analysis of impacts on subistence.

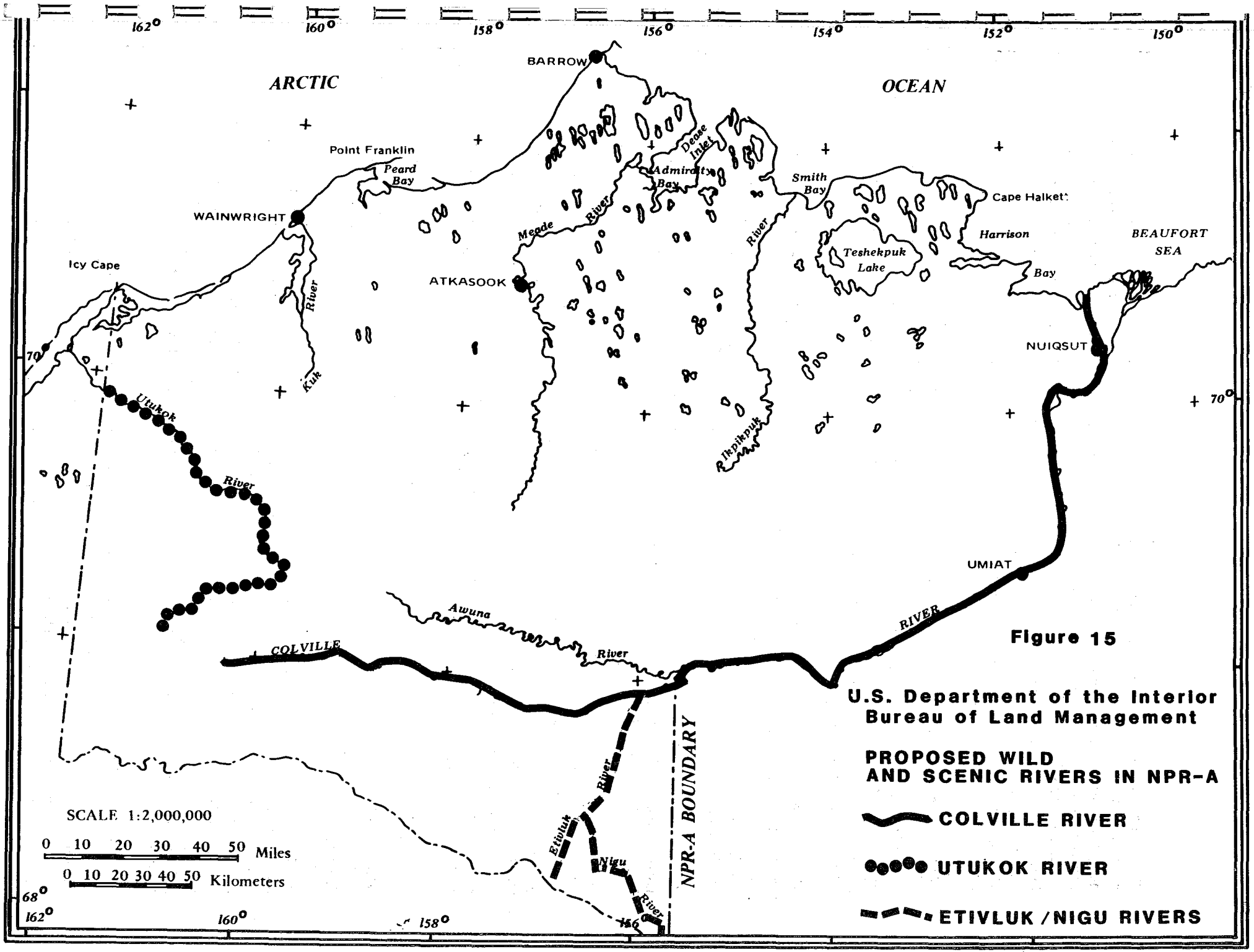
3. Wild and Scenic Study Rivers

The Wild and Scenic Rivers Act (16 USC 1271) was passed October 2, 1968 to "preserve certain selected rivers that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values...in their free-flowing condition...for the benefit and enjoyment of present and future generations." Since its initial passage, the Act has been amended five (5) times. A total of 50 rivers have been added as components to the National Wild and Scenic River System and 26 of these are in Alaska, although none occur in the National Petroleum Reserve. Under the Wild River Act, there are currently 88 rivers designated as study rivers, 12 of which are in Alaska. These 12 were nominated in the most recent amendment to the Wild and Scenic Rivers Act via the Alaska National Interest Lands Conservation Act (ANILCA) (Section 604, 605, and 606) (16 USC 310). Four of these study rivers are in the National Petroleum Reserve-Alaska: the Colville, the Utukok, and the Etivluk-Nigu (Figure 15).

Rivers designated as components of the National Wild and Scenic River System have permanent status as protected areas much like an established wilderness area, a national park, or a wildlife refuge. Rivers nominated as study rivers are protected only while studies are being made to assess whether the river qualifies as a "wild" river. During this period, Congress may act to either include or reject the river as a component. Specific withdrawals and possible activities regarding these rivers are discussed in a later section.

Rivers eligible for inclusion in the system are classified as wild, scenic, or recreational. In February, 1970, the Secretaries of Interior and Agriculture developed and adopted the "Guidelines for Evaluating Wild, Scenic and Recreational River Areas Proposed for Inclusion in the National Wild and Scenic River System under Section 2, P.L. 90-542".

For classification as "wild," a river must be free-flowing and generally inaccessible by road. Shorelines must be primitive, and the waters unpolluted. Activities which can occur within a river corridor that has been designated as wild are restricted. Only limited motorized land travel and primitive type public use is allowed. No unharmonious or new habitations or improvements are allowed. New structures or improvements of old ones can be permitted only if they are in keeping with overall objectives of protecting the river. Subsistance use is allowed in all cases. Fences and gauging stations or other management facilities will be permitted if there are no significant adverse effects on the natural character of the area. Only a limited range of agricultural and other resource uses are allowed.



Source: Section 604 ANILCA

Those rivers classified as scenic are free-flowing but may be accessible by roads, some of which may parallel the river for short stretches. Small communities or agricultural activities are compatible, but the shoreline must remain essentially primitive and the water should be unpolluted. Motorized vehicles are allowed within the land area of scenic rivers. Unobtrusive construction such as campgrounds, visitor centers, marinas, or gauging stations can be permitted, but if significant adverse effects on the natural character of the area occurs screening may be required. Many agricultural and other resource uses may be permitted.

Rivers classified as recreational may have been impounded previously. Shorelines may be extensively developed and readily accessible by roads, railroads, and bridges. New structures can be built in these river corridors for habitation and intensive recreational use and the areas may also be densely settled. A full range of agricultural and other resource uses is possible. The area may have optimum accessibility by motorized vehicles.

The Federal Power Commission cannot license the construction of a dam, water conduit, reservoir, powerhouse, transmission line or other project under the Federal Power Act on or that will directly affect any river designated for inclusion in the National Wild and Scenic River System or for any river in the study category during the period for which it is withdrawn.

Federal agency heads are directed to take necessary protective action respecting management policies, regulations, contracts, plans, etc., affecting these lands and rivers in accordance with this Act.

Additionally, rivers that are components of the system are subject to certain withdrawal provisions of Sections 8 and 9 of the Wild and Scenic Rivers Act under which they are withdrawn from entry, sale, or other disposition under public land laws of the United States. Subject to valid existing rights, the minerals on Federal lands which are part of the system and constitute the river bed or bank or are within one quarter mile of the bank of a component river are withdrawn from all forms of appropriation under the mining laws and from operation of the mineral leasing laws.

In Alaska, the withdrawal has been extended by ANILCA to within one-half mile of each of the banks of any designated river. However, activities on some mining claims pre-dating the withdrawals, or to certain other mineral leases and permits may be continued according to regulations by the Secretary of the Interior (Section 9 of the Wild Rivers Act).

Public lands that constitute the river bed or bank or that are within one quarter mile of those rivers in the study category are withdrawn from entry, sale, or other disposition under the public land laws, except certain rivers in Alaska, including those within NPR-A. Lands in Alaska which constitute the bed or bank or are within an area extending two miles from the bank of the river are withdrawn, subject to valid existing rights, from entry, sale, State selection, or other disposition under the public land laws of the United States.

The minerals in any Federal lands which constitute the river bed or bank or are situated within one quarter mile of the bank of any study river are withdrawn from all forms of appropriation under the mining laws. Certain lands in Alaska, including those within NPR-A, that constitute the river bed or bank or are within an area extending two miles from the bank of the river channel or

within an area extending two miles from the bank of the river channel on both sides of the river are withdrawn. These withdrawals are subject to valid existing rights from all forms of appropriation under the mining law, and from operation of the mineral leasing laws, including in both cases their amendments, during a specified withdrawal period.

The length of withdrawal for those rivers in study status is discussed in detail in Section 7 of the National Wild and Scenic Rivers Act. In general terms, it provides for a three year period to complete a study to determine whether a river is suitable for inclusion in the National Wild and Scenic River System and a second subsequent three year period for Congress to review and accept or reject the river as a component of the Wild River System.

In addition to definitions of types of rivers, enumeration of component and study rivers, and a discussion of types of withdrawals and their time frames, the Wild River Act also discusses land acquisition, rights and use of occupancy, water resource developments, the involvement of the State, and the administration on the Wild and Scenic River System. For more detailed information on all of these items, refer to the original Wild and Scenic Rivers Act, as amended, particularly Section 604-6 in ANILCA, which deals with Wild Rivers, and the legislative history of the Wild Rivers Act discussed in House Report No. 1623.

The following represents a brief chronological list of policy development with respect to proposed National Rivers within NPR-A. This list is intended to indicate the long history of resource value legislation instituted by Congress and the Administration with respect to the proposed Wild and Scenic Rivers.

Table VI

An Administrative History of the Proposed Wild and Scenic Rivers

Event	Intent
1971 - Alaska Native Claims Settlement Act of 1971, Section 17 (d)(2)	Allows the Secretary of Interior to deem certain rivers suitable for addition into the Wild and Scenic Rivers System.
1976 - Naval Reserve Production Act of 1976 (P.L. 94-258) Section 104(b)	This Section does not relate specifically to the Wild and Scenic Rivers System but emphasizes the resource values and need for careful management and protection in Utukok River and Teshekpuk Lake areas.
Section 105(c)	Establishes an interagency Task Force "to conduct a study to determine the values of, and best uses for, the lands contained in the Reserve (NPR-A)" and submit a report to the Committee on Interior and Insular Affairs of the Senate and the House of Representatives.

Event	Intent
Federal Register Notice, Vol. 42, No. 107 (pursuant to Section 104(b) Naval Petroleum Reserves Production Act of 1976; 1977)	Establishes the Utukok River Uplands, the Teshekpuk Lake area, and the Colville River area as Special Areas. This notice also establishes general management objectives for these areas.
1979 - NPRA river reports entitled A Wild and Scenic River Study: the Utukok, Colville, and Nigu/Etivluk Rivers; submitted to the State Director, BLM from the Area Director, HCRS April 1979)	Provides the NPR-A 105(c) Task Force with necessary documentation for recommending that selected NPR-A rivers be included in the National Rivers System.
Submission of the 105(c) Final Study to Congress by the Secretary of Interior	This report presents six land use options for NPR-A to Congress. Of these six options, four include recommended "wild river" designations, one includes recommended "scenic river" designations and one recommends status quo (no designation).
1980 - Alaska National Interest Lands and Conservation Act of 1980, Section 606(b)	Amended Section 9(b) of the Wild and Scenic Rivers Act designating the Utukok, Colville, Nigu and Etivluk Rivers for study for potential inclusion in the National Rivers System.

The concerns for the resource values within the proposed Wild and Scenic Rivers in NPR-A has been expressed during the past year of the NPR-A leasing process. Table VII documents the interest groups that have voiced or expressed written concern during that process. The basis for concern is discussed generally and reflects a wide range of values. These values have been formerly recognized through legislation; Section 5(a) of the Wild and Scenic Rivers Act as amended by Section 606(b) of ANILCA nominated these rivers as study rivers for possible inclusion in the Wild and Scenic River System. The "Wild and Scenic River Analysis" that was prepared by Heritage Conservation Recreation Service (HCRS) and forwarded to Congress in April 1979 provided the necessary documentation to support the contention that these rivers are in fact unique ecosystems worthy of special attention and protection.

The question to be answered in the EIS is whether the values within these corridors could be significantly impacted by leasing and possible production of oil and/or gas. Strictly from the stand point of the management agency, the well documented concerns described above are enough to subject this issue to the NEPA process. Without specific management policy with respect to recreation and ecosystem management in NPR-A, it is difficult to describe a policy framework that should and ultimately must be based on perceived values. Professional judgement would be based on the following logic:

Table VII

Public Comments on NPR-A Leasing Process

Person or Group	NPR-A Process	Areas of Comments
Friends of the Earth	Sale Schedule Comments	Unique Values, Special Area Natural Values, Wilderness
State of Department of Policy Development & Planning.	"	Critical Habitat Alaska
The Wilderness Society	"	Special Areas Wild and Scenic Rivers
North Slope Borough	"	Buffering Along Subsistence Waterways
Sierra Club	"	Wildlife Habitat
SOHIO	General Comments on EA	Rivers Not Yet Designated Exploration Impacts are Temp.
National Wild Federation	"	Biological Special Area life Wild and Scenic River Proposal Impacts if used as gravel source.
The Wildlife Society-Alaska Chapter	"	Biologically Sensitive Area
Village of Wainwright	Public Meeting/EA Comments	Subsistence
U.S. Department of Interior, Fish and Wildlife Service	EA Comments	Peregrine Falcons, Whistling Swans
Sierra Club	"	Wild and Scenic River, Peregrine Falcons
Belle Dawson	"	Critical Habitat

* The proposed Wild and Scenic Rivers in NPR-A are significant wilderness ecosystems that warrant protection for many reasons. These values cannot be understood separately but must be managed in the context of the whole.

> The emphasis is on the dynamic nature of ecosystems, their strong internal linkages and the ways various human activities have affected and continue to affect the "naturalness" of wilderness ecosystems. Only when ecosystem dynamics, including interrelationships with man, are fully understood can an assessment of the consequences of alternative management strategies be made. (Hendee et al, 1978)

* The management of the Proposed Wild and Scenic Rivers should be governed by a concept of non-degradation. "...this principle seeks recognition of the variation in the level of naturalness and solitude available in individual wilderness. The objective is to prevent further degradation of current naturalness ...rather than letting all areas deteriorate to a minimum standard." (Hendee et al, 1978)

It could be argued that this principle sets the "significance threshold" that is described in the CEQ regulations for implementing NEPA. Subsequently, exceeding this threshold would result in a "significant impact" and therefore would be considered an issue that should be investigated further through the standard EIS process.

There are several management alternatives that realistically could be implemented on the Colville, Utukok and Etivluk/Nigu Rivers. Each alternative offers a relative level of protection depending on the critical resource(s) involved.

Further research of each of these options will be developed through the EIS process. The following questions will be addressed in detail:

* How can resource values occurring in these river systems best be protected?

* What will the actual impact of oil and gas development be on these river systems?

* How will oil and gas development be accomodated under each management framework?

The following alternatives are proposed for discussion in the EIS process:

a. Wild and Scenic River Designation

This alternative has received the most consideration and discussion of all the alternatives. The following statement from the 105(c) studies indicates general management intent with respect to NPR-A rivers:

> These rivers possess remarkable scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values and are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. Existing river uses including access by motorboat, snow machines and airplane, hunting, fishing and trapping, subsistence activities, fish camps, and recreation are not affected by Wild River designation. The designation, however, is up to Congress.

b. Status Quo - No Designation

If no action is taken with respect to formal designations on these rivers, the current study river withdrawal will terminate. At that time, the Colville, Utukok, and Etivluk/Nigu Rivers will revert back to original status with NPR-A. Protection will be discretionary as it is on other public lands under BLM Management.

c. Areas of Critical Environmental Concern (ACEC)

While this designation has not been used within BLM in Alaska, it has applicability and should be considered as a management option. The Colville and Utukok River valleys are particularly fitting for this designation.

> The terminology, 'Areas of Critical Environmental Concern,' does not reflect a legal classification or withdrawal of Federal lands managed under a precise set of regulations, but rather suggests an area identified by intensive inventory and assessment to require management of critical environmental values. For some values, such as critical habitat for endangered species, protection is legally mandated while for other values protection is discretionary. FLPMA, defines Areas of Critical Environmental Concern (ACEC) as: '...areas...where special management attention is required... to protect and prevent irrepairable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.' Under this concept, high priority is given to designating critical environmental areas in order to highlight values requiring special management considerations. The mandate is not single-resource oriented. It allows for management spanning a wide range of environmental values where critical non-commodity values must be calculated at the same level of importance as commodity-related values. ACEC offers a means of protection other than through specific withdrawals and may be more flexible than specific withdrawals as other uses are not precluded if consistent with needed protection of critical values. The land manager is required to weigh optional forms of protection of the designated area, as well as protection versus use or development. Identification or designation of ACEC's highlights the values involved and mandates a thorough evaluation of single and cumulative effects of any proposed action. Such actions could be permitted, or permitted under certain conditions, or prohibited depending on the evaluation of anticipated change. 105(c) Final Study NPR-A Task Force, 1979.

d. Birds of Prey Natural Area

There is one designated Birds of Prey Natural Area on the Snake River in Idaho which is currently under BLM management. The Colville River may be suited for such a designation. Guidelines for planning and management are not available at this time but should be explored through the EIS process.

4. Proposed Alternatives

On the basis of the preceeding discussions the following tentative findings and decisions are proposed as the basis for an Oil and Gas Leasing EIS on parts of NPR-A.

a. Issues associated with leasing in areas between and inland from Icy Cape and Point Franklin are highly controversial including, among other regional concerns, the leasing of lands which are of high subsistence value; contain biological resources which are of significant value; and contain biological resources (waterfowl) subject to the protection of international treaty.

b. Because of the findings in a, the leasing of these lands would constitute a major Federal action requiring an Environmental Impact Statement (Figure 5, Study Area 1).

c. The area from Peard Bay to the mouth of the Colville has associated issues which would make oil and gas leasing highly controversial including, among other regional concerns, the leasing of lands which are of high subsistence value; contain habitat of great value then a significant biological resource (the resident Teshekpuk Caribou Herd); contain biological resources (waterfowl) subject to the protection of international treaty; and, contain polar bear (maternal) denning habitat.

d. The findings in c indicate that the leasing of these lands would constitute a major Federal action requiring an Environmental Impact Statement (Figure 5, Study Area 2).

e. The Utukok Uplands have associated issues which would make oil and gas leasing highly controversial as this area contains the core calving grounds of the Western Arctic Caribou Herd and, therefore, this area is critical to the lifecycle of a significant biological resource which is central to the subsistence culture of North Slope rural residents and a biological resource managed by, and of great concern to, the State of Alaska.

f. Because of the findings in e the leasing of the Utukok Uplands would constitute a major Federal action requiring an Environmental Impact Statement (Figure 5, Study Area 3).

g. The Colville, Utukok and Etivluk-Nigu Wild and Scenic Rivers Study Rivers constitute Study Area 5 in Figure 5.

h. The remaining lands in NPR-A were found to have less controversial issues relative to oil and gas leasing and, if it is proposed that leasing takes place in these non-controversial lands, the proper NEPA document for analyzing the impacts of leasing would be a programmatic or site specific Environmental Assessment (EA).

Each study area is subject to precisely the same proposed action, a Congressionally mandated expeditious program of oil and gas leasing which gives maximum protection to the surface values of the lands to be leased. The degree to which the surface values would be protected varies according to the alternative ways in which leasing would be allowed. One objective of an EIS and the public review process which accompanies the preparation of the EIS is to determine which alternative(s):

* in the view of competent professionals most likely will succeed in protecting the surface resources;

* in the public view most likely will preserve those surface resources highly valued by the public;

* in the view of the applicant (in this case the Lessee) be most cost effective (produces the greatest degree of protection for environmental values at the least cost to the applicant).

The tentative alternatives for each subsistance/biological study area are shown in Table VIII.

C. Issues With No Significant Impacts

1. Biological Resources

The following issues would not incur significant impacts from leasing, exploration, and production of oil and gas because adequate standard mitigation measures will be applied to reduce foreseeable impacts. In addition, standard Arctic construction and travel methods will protect these resources. The NEPA test for significance was done and is summarized for each species below.

a. Moose

Little of NPR-A is considered high or even medium density habitat for moose. Very few moose occur north of the Colville River in winter with the only repeated sightings occurring on the upper Ikpikpuk River. In summer, moose on NPR-A are widely scattered over the Coastal Plain and in the Foothills in the Kokolik and Utukok drainages (NPR-A Task Force, 1978). Moose are normally very tolerant of most human activities. Potential impacts on moose include aircraft disturbance, riparian habitat alteration, and stem from pipeline/road routing, design, and construction. They are describable and tend themselves to mitigation through site-specific or activity specific stipulations imposed during the permitting process. A large percentage of the riparian moose habitat on NPR-A also will receive additional protection under the special operating stipulations inherent in wild and scenic river designation.

b. Wolf

Although the present wolf population is low over most of NPR-A, historically it was apparently higher. Highest wolf densities are now found in the extreme southern part of NPR-A with the majority of high density habitat associated with the Noatak drainage south of the De Long Mountains (NPR-A Task Force, 1978; NPR-A Work Group 3, Chapter 3, Stephenson, 1979).

Protection of NPR-A wolf populations will be achieved by placing restrictions or stipulations on oil and gas development. Activities that would destroy denning habitat, preclude use of denning sites, or decrease the availability of major ungulate prey species will be prohibited. Guidelines on feeding wolves, creating attractive nuisances leading to human-wolf conflicts, and harvest of wolves by those associated with resources exploration and development will be promulgated and enforced.

c. Wolverine

Wolverines found throughout NPR-A use all NPR-A habitat types but are most common in the Brooks Range and Foothills. No specific part of NPR-A appears to be a unique or ecologically criticial area for wolverines according to current data (NPR-A Task Force, 1978).

TABLE VIII
Draft Alternatives

Study Areas	Description of Tenative Alternatives
One, two, and three	(A) Withdrawal Leasing - Under this alternative certain lakes, portions of the wild and scenic study rivers, possibly some coastal features (capes and bays) and river deltas would be withdrawn from leasing. No lease unit (tract) would include, or come within ¼ mile of, any withdrawn lands. (B) No Surface Occupancy Leasing - Under this alternative any lands in the study area could be leased but sensitive areas would be restricted. No operations could take place on any sensitive area. (C) Phased Leasing - Under this alternative critical habitats would be identified, and leasing would be phased so that no more than a certain proportion of the critical habitat would experience simultaneous operations. An example is leasing only 20 percent of the class five wetlands at any given time and requiring that initial leases be relinquished or expire before additional class five wetland leasing can take place.
Two and three (D&E do not apply to study area one)	(D) Design Solution Leasing - Under this alternative all lands could be offered for leasing, but the oil and gas operations which took place in a sensitive environment would have to be specially designed and managed to: (1) reduce the number of personnel (who must be) in the sensitive environment by substituting capital goods, such as remote pipeline sensing systems, for labor; and, (2) reduce the frequency of human activity within or above the sensitive environment by, for example, using inventory control models to assure that a facility will not have to receive supply flights during critical lifecycle periods of key species. (E) Seasonal Restriction Leasing - Under this alternative all lands could be offered for leasing, but during certain critical periods of each year, all oil and gas related operations would have to cease. This would include the field shut-in option which Conoco has so successfully employed in protecting the Aransas National Wildlife Refuge, critical to Whooping Cranes.

(Table VIII cont'd)

Three (F only applies to study area three)	(F) Deferred Leasing - The State of Alaska is on record as desiring that simultaneous impacts on the calving grounds of the Western Arctic Herd, the Porcupine Herd and the Central Arctic Herd be precluded by not leasing more than one calving ground at any given time. Production from the Kuparuk field is anticipated through at least the year 2005. Since the Kuparuk field will influence the calving grounds of the Central Arctic Herd, this alternative would defer leasing of study area 3 or as much of it as is critical calving habitat until the year 2000.
Four Wild and Scenic Rivers	(G) Status Ouo - Protection of resource values under BLM management will be the same as on other public lands under BLM management.
(G and H apply to study area four only. Alternative A also applies).	(H) Special Protection - identified by intensive inventory and assessment to require management of critical resource values either as Wild and Scenic Rivers or some other restrictive classification such as a Birds of Prey Natural Area or Areas of Critical Concern.

Site-specific mitigation/stipulations for the protection of riparian habitat and areas with evidence of recent wolverine use will give adequate protection at the population level. Any harvest of wolverine by exploration or development personnel will be prohibited. Protection of caribou and their habitats will also provide secondary benefits for wolverines.

d. Arctic Fox

Arctic fox can be found throughout NPR-A but are most common on the Coastal Plain. Populations in northern Alaska fluctuate with those of the lemming but extremes apparently are dampened by availability of alternative food sources (NPR-A Task Force, 1978).

Arctic fox populations on NPR-A will be protected adequately during oil and gas development by use of restrictive stipulations on permits to control alteration of denning or feeding habitat on the Coastal Plain and to prohibit feeding by workers or the establishment of attractive nuisances such as inadequate waste disposal leading to artifical concentrations capable of damaging facilities, creating public health hazards (rabies), and increasing local predation on nesting birds.

e. Red Fox

Red fox on NPR-A usually are found in association with riverine habitat in the northern and southern Foothills. The general opinion among Arctic biologists and residents is that red fox have increased in abundance and range in Arctic Alaska in recent decades (NPR-A Task Force, 1978).

Effect mitigation involving restrictions on activities that would destroy denning and feeding habitat in the riverine environments of the Foothills will provide adequate protection to red fox populations. Creation of attractive nuisances will not be allowed in order to discourage the attraction of red foxes that consequently might be require destruction to protect public health (rabies).

f. Muskox

Although muskoxen have been sighted on the Reserve, there is no established group on NPR-A and there are no plans to introduce them to NPR-A.

g. Tundra Hare

The tundra hare is not present on NPR-A, and there are no plans to introduce them.

h. Gulls, Terns, and Jaegers

Gulls and terns are generally associated with habitats of the Coastal Plain, particularly the coastline. Jaegers prefer the Foothills and southern Coastal Plain of NPR-A (NPR-A Task Force, 1978).

Site-specific regulations regarding: proper garbage disposal to discourage abnormal concentrations of gulls; habitat alterations impacting the prey species of jaegers; or alteration of the spits, islands, and lagoons used by Arctic terns and gulls will adequately protect these populations during development.

i. Ptarmigan

Both willow and rock ptarmigan are found on NPR-A. Willow ptarmigan, primarily associated with the Foothills and occasionally found on the Coastal Plain, are migratory to some extent between habitats in NPR-A and south of the Brooks Range. Rock ptarmigan are found primarily in the alpine tundra and barren areas of the Brooks Range (NPR-A Task Force, 1978).

Mitigative stipulations designed to restrict any development activities that would destroy or preclude from use any ptarmigan upland winter feeding habitat or concentration areas used in spring before nesting will adequately protect ptarmigan.

j. Passerines

Passerine birds are well distributed over NPR-A in summer. During the 1977 aerial survey, approximately 97 percent of all passerines observed were Lapland longspurs. The only resident passerines are ravens, snow buntings and a few Lapland longspurs (NPR-A Task Force, 1978).

With the probable scattered distribution pattern of oil and gas development on NPR-A, there should be no significant impacts upon passerines. Restrictive stipulations placed on activities for the protection of other resources will secondarily protect passerine populations from any signficant loss.

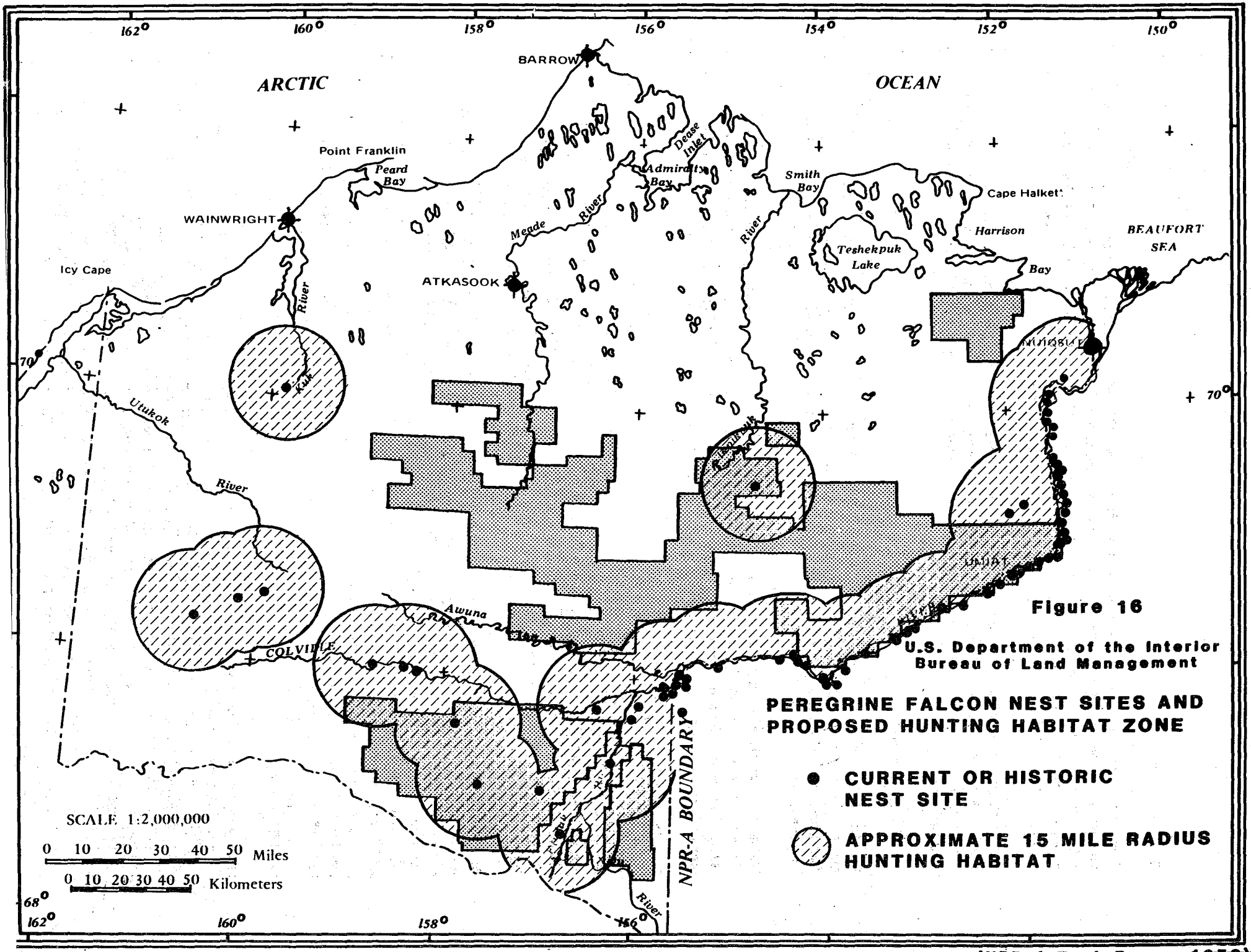
k. Peregrine Falcon

The Colville River, the full length of which borders NPR-A, is recognized along with its main tributaries as the main nesting habits for the endangered Arctic peregrine falcon (Falco peregrinus tundrius) in North America. Figure 16 shows the nest sites along the Colville drainage as well as other known sites in NPR-A. Fifteen mile radius circles have been drawn from each nest to illustrate the typical extent of hunting habitat (NPR-A Task Force, 1978).

On May 6, 1981, BLM initiated a formal consultation process with the U.S. Fish and Wildlife Service (USF&WS) under the Endangered Species Act of 1973. This consultation process and the USF&WS response of June 4, 1981 resulted in several oil and gas lease stipulations designed to protect peregrine falcons. The lease stipulations and the requirements of the Endangered Species Act of 1973 provide adequate protection to the peregrine population from any oil and gas activity impacts. Further NEPA compliance to lease in peregrine falcon habitat is not required as review of all projects under the Endangered Species Act will ensure that there can be no impacts on peregrines.

l. Other Raptors

Five species of raptors, in addition to the peregrine falcon, are present on NPR-A. Golden eagles (Aquila chrysaetos) nest in the Brooks Range and Foothills on NPR-A while gyrfalcons (Falco rusticolus) are resident on NPR-A and nest on cliffs along river courses. Rough-legged hawks (Buteo lagopus) also nest on cliffs along river courses and at some off-river sites. Snowy owls (Nyctea scandiaca), an NPR-A resident, and short-eared owls (Asio flammeus) nest on the open tundra primarily on the Coastal Plain. Raptor populations in any given area of NPR-A vary from year to year due to drastic fluctuations in prey populations which directly affect raptor nesting locations and productivity. None of these raptor species is endangered in Alaska (NPR-A Task Forces, 1978).



Source: (NPR-A Task Force, 1978)

Lease stipulations for the peregrine falcon will secondarily provide a measure of protection to other cliff-nesting raptors. Site-specific stipulations imposed during the permitting process will provide adequate safeguards to protect the scattered NPR-A populations during oil and gas activities. Greatest emphasis during the permitting process will be placed on protecting the nesting areas from disturbance from April to August and minimizing disturbances to prey species habitat.

m. Loons

The loon species of NPR-A's Coastal Plain are Arctic (Gavia arctica), red-throated (G. stellata) and yellow-billed (G. adamsii) with common loons (G. immer) occasionally observed in the southern Foothills and mountains. Recent studies have indicated that the Arctic loon is the most widely distributed on NPR-A (NPR-A Task Force, 1978).

Although not documented, it is surmised that a realistic modeling of expected NPR-A oil and gas development on the Coastal Plain may show detrimental site-specific effects on any high density (3 to 7.3 per square mile) loon habitat encompassed by the development. However, these expected site-specific impacts should not be of NEPA significance at the population level as large tracts of high density habitat will remain untouched except for winter exploration. It is believed that lease or permit stipulations for activities occurring within high density loon habitat can minimize potential disturbances to loon use and pollution of the isolated habitats they prefer.

n. Whistling Swans

Highest swan densities on NPR-A occur west and southwest of Teshekpuk Lake and in the Colville River delta (NPR-A Task Force, 1978). All indications point to the conclusion that whistling swans are primarily associated with the wet sedge meadow vegetation type on NPR-A.

Swans probably more than any other species of bird would be easily displaced by human activities. Because swans are easily observed, their disappearance would be one of the best indicators of environmental degradation.

However, the population of approximately 3,000 whistling swans in NPR-A is not a significant portion of the total North American populations (NPR-A Task Force, 1978). It is believed that lease or permit stipulations would be effective in curtailing conflicting activities near high densities (one or more per square mile) of swans. The resulting mitigated impacts upon swans would not be of NEPA signifiance.

o. Fishery Resources

Individual fish species have not been listed. Their habits, habitat and impacting factors are similar enough to treat as a group.

Petroleum exploration and development within NPR-A may eliminate or reduce the size of specific aquatic habitats used for fish migration, spawning, and overwintering or may stress fish using these areas. When fish are concentrated in limited areas for spawning and overwintering, they are vulnerable to catastrophic short term or chronic low level disturbances that may result in marked

population reductions. However, if the fish species is well distributed, as most species are on NPR-A, it is doubtful that the localized short term disruptions anticipated from petroleum activities will have a significant effect on the population as a whole. Nevertheless, each proposed petroleum activity must be investigated during the permitting process to insure that proper site specific stipulations are attached to a permit because no comprehensive formula to protect every aquatic resource or habitat has been or can be developed.

At the current level of understanding about NPR-A fish and their habitat, fishery management plans and impact projections in the face of petroleum development can only be discussed in general on a Reserve wide basis. Important habitat for several fish species is recognized in the Colville River drainage and in the deep lakes in eastern NPR-A. Although most waters on NPR-A have not been inventoried and the fisheries potential for these lakes and streams is unknown, inventory to date has revealed no area on NPR-A where impacts stemming from petroleum activities would constitute a NEPA significant issue.

Site-specific stipulations for each petroleum activity imposed during the permitting process should be sufficient to preclude the occurrence of a NEPA significant impact. The design of fishery protection stipulations must recognize that areas identified as important for subsistence uses may require the most stringent habitat protection even though biologically these sites may be relatively unimportant. Conversely, the biological base of a subsistence fishery may depend on the quality of habitats located great distances from the actual fishery site. Therefore, even though no significant individual or cumulative impacts are envisioned due to the application of site specific stipulations, all activities must be carefully evaluated to protect the resource and maintain the integrity of the natural ecosystem.

NEPA Test of Significance

1. No unique areas for fishery resources on NPR-A have been found. No areas on NPR-A can be defined as crucial to an NPR-A fish species or Reserve wide population survival.

2. Site-specific stipulations including no occupancy clauses in subsistence fishery areas should be sufficient to reduce controversy.

3. The impact projection process for petroleum activity in the Arctic as applied to NPR-A fishery resources is sufficiently understood to preclude the appearance of totally unique or unknown risks.

4. No precedent is expected.

5. The localized short term disruptions expected from petroleum activities neither will have significant effect on the NPR-A fish population as a whole no cumulatively significant impacts.

6. No loss or destruction of scientific resources pertaining to fish on NPR-A is expected.

7. There are no endangered or threatened fish species present.

8. Violation of laws imposed for the protection of the environment will not be tolerated.

p. Threatened and Endangered Plants

Two proposed endangered plant species have been identified within NPR-A by Murray (1980). Mertensia drummondii and Salix ovalifdia var. glacialis are known to grow on sand dunes south of Barrow and Mertensia was also discovered by See (personal communication) on sand dunes north of Umiat.

Although not known to exist in NPR-A, two proposed threatened plant species, Erigeron Muirii and Montia bostockii, have a high probability of occurring on dry slopes and on wet alpine sedge-grass-forb meadows or moist centers of frost scars (respectively) within the NPR-A boundaries (Figure 17).

Although none of these four species are officially listed as threatened or endangered, it is BLM policy (BLM manual section 68-40, IM AK80-722 change 1) to provide protection to proposed species equivalent to officially listed species. In addition, a 1979 ammendment to the Endangered Species Act of 1973 provides partial protection to species formally proposed for listing. These four species were recognized as proposed in the Federal Register of December 15, 1980 Vol. 145, No. 242.

The following mitigation measures will prevent adverse impacts to these plant species.

All known population sites (see Figure 17) and identified critical habitats will be excluded from surface occupancy. Population sites need not be protected from natural fires but will be protected from man-caused fires. Areas identified for surface impacting activities, such as off road traffic or construction, will be searched for these species by a qualified botanist. This site examination should occur between July 7 and August 1 and should take place concurrently with archeological site examination. Areas adjacent to known population sites will be closely examined. Those have similar environmental conditions to known population sites, such as terrain characteristics, soil, and companion plants, will be carefully examined and set aside as potential critical habitat or expansion habitat as required. Because of the limited knowledge of the extent of populations and habitat requirements, field work on threatened and endangered plants by industry should be coordinated with BLM and the USF&WS.

2. Other Issues

a. Slope

Slope is the determining factor controlling erosion potential. Other factors influencing erosion potential are soil texture, slope length, surface cover, soil moisture, permafrost type and content, type and degree of disturbance, and type and intensity of such erosion agents as wind or running water in conjunction or independent of thermal degradation.

Land use limitations related to percent of slope is usually divided into 5 categories: 0-3%, 4-6%, 7-15%, 16-30% and 30% (as shown in Table IX). Depending on the projected use, a pragmatic assessment of potential sensitivity can be developed. Within NPR-A, the two major surface impacting activities which will be assessed for potential impact are winter off-road traffic and pad and road construction. The following mitigation measures will provide adequate protection from these impacting activities.

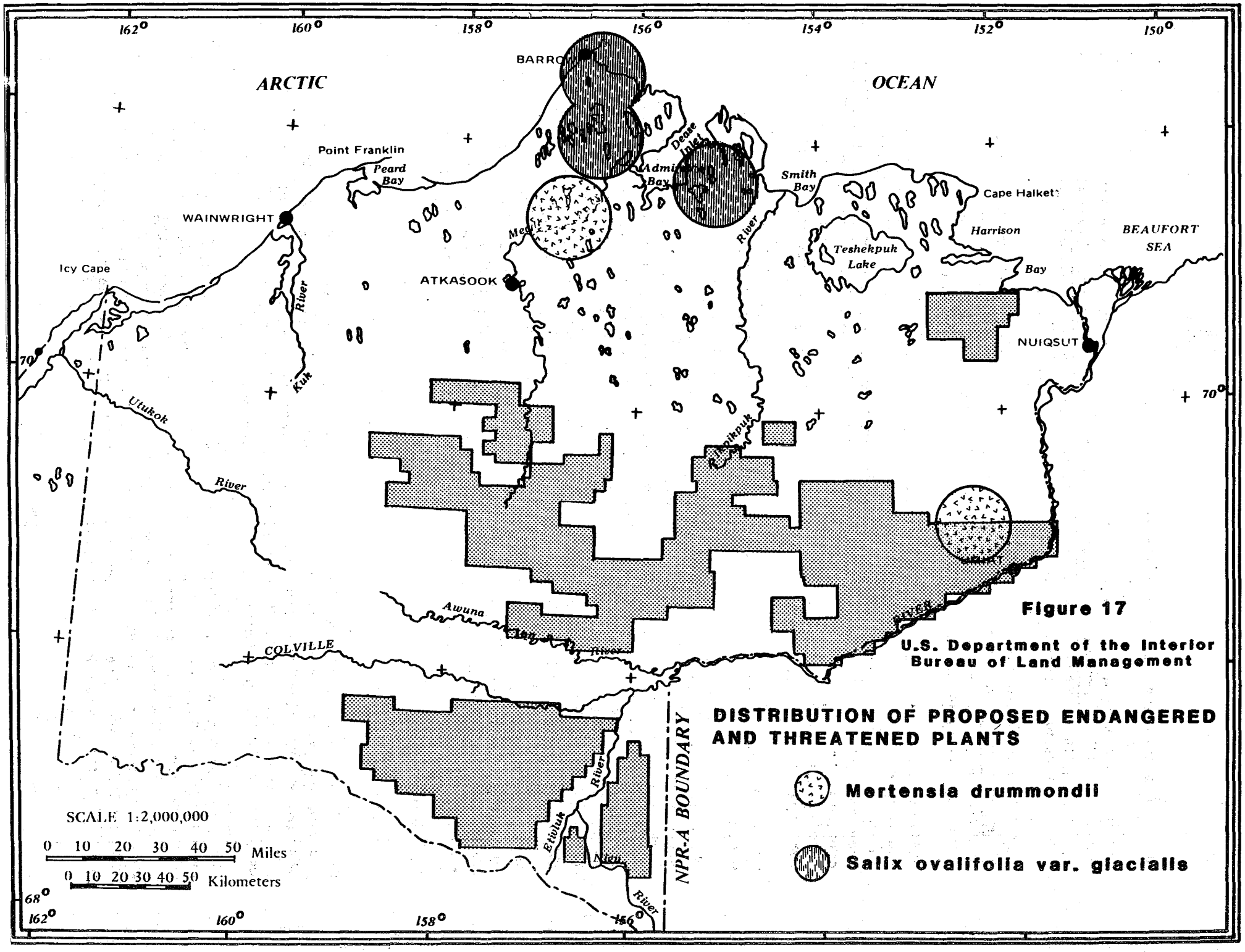


Figure 17

U.S. Department of the Interior
Bureau of Land Management

DISTRIBUTION OF PROPOSED ENDANGERED AND THREATENED PLANTS

Table IX
Land Use Limitations Related to Percent of Slope

0-3%	Of little concern if areas of tall shrub are avoided and there is compliance with the above stipulations.
4-6%	Of little concern if areas of tall shrub are avoided and there is compliance with the above stipulations.
7-15%	Efficiency of overland operation decreases. Doubling of towing vehicles or cabling up short steep slopes required. Distribution of snow is often variable resulting in deep drifts and barren windswept ridges. The potential for surface disturbance increases to moderate levels.
16-30%	Overland operations generally are inefficient. Snow distribution is variable. There is a considerable reduction of towing efficiency required to prevent major disturbances. This slope gradient category should be avoided by special routing. Agency monitoring should be concentrated on these areas.
30%	Overland operations should be greatly restricted. Short slopes of this magnitude should be identified as major obstacles when developing routing plans. These sites should be closely monitored during overland operations.

Table X
Erosion Potential Related to Percent of Slope

0-3%	Low hazard from transport erosion but thermal erosion hazard is moderate to high due to possible ponding of melt water or precipitation.
4-6%	Hazard of transport erosion through channelized water run-off flow is moderate. Thermal erosion potential is moderate to high in areas subjected to running water or exposed south slopes.
7-15%	Transport erosion hazard is high. Thermal erosion potential is high in areas subjected to running water or on south-facing slopes. Presence of ice-rich permafrost somewhat less on steeper south-facing slopes.
16-30%	Transport erosion hazard is very high. Thermal erosion potential high in areas subjected to running water on south-facing and steeper slopes. Presence of ice-rich permafrost is less likely on steeper slopes.
30%	Transport erosion hazard is extremely high except in areas with low percentages of silt and/or clay (rocky barren areas). Thermal erosion hazard is low to moderate due to the low water-holding capacity of rocky alpine soils.

(1) Off-road vehicular traffic will be restricted to low ground pressure vehicles and permitted only during periods when frost depth exceeds one foot and when there is a surface protecting layer of snow of at least 6 inches.

(2) Current Arctic engineering practices will be utilized to ensure protection of thermoequilibrium of permafrost soils containing ice. Channelized water run-off flow will be minimized to prevent transport erosion and accelerated thermal erosion. Unnatural ponding of water will not be allowed. Linear pads should provide for natural water flow at the seasonal thaw/frozen soil interface. All impacted surfaces will be protected from wind, water or thermal erosion.

b. Soil/Permafrost

Soil stability is the major physical feature controlling the engineering capability and limitations of a site. Due to NPR-A's geographic location, soil sensitivity is generally high and is closely correlated to the character of permafrost within the soil body.

Soil features affect the design, construction, and performance of roads and highways. Soils with the greatest limitations for roads are those underlain by ice-rich permafrost, organic soils, and other poorly drained soils. High frost action potential, susceptibility to flooding, steep slopes, excessive stoniness, and shallowness to bedrock are also limiting factors. In addition, soils that are subject to severe erosion, particularly to wind erosion after clearing, are considered to have detrimental features for road construction.

The presence of an ice-rich frozen substratum which thaws and settles unevenly for years after construction is the major reason most soils in NPR-A receive a severe limitation rating. Standard Arctic construction provides for foundations for roads and pads to be built by use of thick layers of gravel or synthetic insulation to control thermal disruption underneath.

Other problems, such as surface and thaw zone water flow create additional engineering problems. Roads and other linear pads tend to dam surface and near surface water creating ponding capable of storing heat from the sun. This ponding accelerates the melting of subsurface permafrost that in some cases could lead to thermokarst development which is severe slumping of melted permafrost ground. This results in an erosion condition that is extremely difficult to control.

Other soil limitations include deep organic soils which are usually wet throughout the summer and have a low load-bearing capacity even when dry. Because of their wetness, low bearing strength, and high susceptibility to frost action, organic soils make poor building sites. Limitations are most severe where the thickness of the organic material over the mineral substrate is more than 50 inches. Organic soils with shallow permafrost can be treated much like other frozen soils if permafrost is preserved at its original level. Because of their wetness, low bearing strength, and high susceptibility to frost action, organic soils make poor building sites. Limitations are most severe where the thickness of the organic material over the mineral substrate is more than 50 inches.

Special engineering precautions are necessary to built roads on soils that are subject to flooding. Loamy soils, especially deep silty soils occurring on sloping ground, require protection against erosion in roads, ditches and cuts. Sandy soils are highly susceptible to wind erosion when natural vegetation is removed.

Within the permafrost zone large structures are usually constructed on piles that provide an insulating air space between the heat of the building and the frozen ground. Piles must be constructed to prevent heat conduction.

Potential damage to structures in permafrost zones is most severe on loamy soils in which the proportion of ice in relation to mineral material in the permafrost is high. Problems are minimized and may even be negligible in well drained sandy or very gravelly soils that have a deep permafrost table or in very gravelly, cobbly or rocky soils with little solid ice.

Poorly drained soils in NPR-A almost invariably have underlying permafrost. Problems of wet soils are compounded by this underlying permafrost. Potential frost action is a major consideration in the design and location of low buildings. Silty soils and organic soils are most strongly susceptible to frost heaving, even to depths of 10 feet or more. Frost susceptible soils have extremely severe limitations as building sites.

Steep slopes increase the difficulty of construction, may lack stability, and in many places are highly erodible when the native vegetation is removed. Although excessive stoniness and shallow bedrock may increase building costs in the Arctic, these sites should be preferred because they reduce the problems of permafrost instability.

c. Off-road Traffic

Off-road traffic refers to cross-country movement of conventional wheeled and tracked vehicles, including construction equipment. Such special low ground pressure vehicles as rolligons and hovercraft, designed for movement across unfavorable terrain, were not considered. No consideration was given to such factors as density of vegetation, occurrence of lakes or streams, or thickness of snow cover. Surface features of importance to off-road vehicular movement are duration of wet conditions soil texture as related to ability to support loads and to provide vehicle traction, amount of dust generated by traffic, and erodibility of the soil.

Vehicular traffic will be prohibited on soils that remain wet throughout the summer. These soils are underlain by solid ice-rich permafrost, organic soils, and poorly drained mineral soils. Vehicles bog down easily on wet soils that have been repeatly traversed in the same path to the extent that destruction of the native vegetation occurs. Organic soils are particularly susceptible.

Soils with ice-rich permafrost at shallow depths also are vulnerable to damage by traffic. Depressions left by wheels or tracks result in increased depths of thaw and a concentration of surface water in the depressions. Water run-off over frozen slopes easily creates deep gullies that are impassable and almost impossible to control.

Standard practice in the Arctic is to use only low ground pressure vehicle in the summer and only if over-land movement is absolutely necessary and roads are not available. Otherwise, travel is confined to winter ice roads, to aircraft use or over constructed roads.

D. Probable Legal Restrictions to Leasing

The following items are included because they may restrict leasing options or development activities in the Reserve. They will not be discussed in the leasing EIS.

1. Native Allotments

The majority of approximately 200 Native allotment applications in NPR-A are located in the northern half of the Reserve. When a certificate of allotment is issued, it shall contain a reservation to the United States (pursuant to Section 2 of the Act of March 8, 1922 or Public, No. 165) for all rights to the coal, oil, or gas, together with the right to prospect for, mine and remove these minerals (43 CFR 2093.4-1).

The allottee should be advised of oil and gas lease issuance and any activities related to the lease that would involve the surface of the allotment. The allottee should be given the opportunity to make comments on proposed surface disturbance. The lessee is liable (43 CFR 2093.0-7) to the allottee for any damage to crops or improvements and must provide required bonds (Forms 3104-1 or 3104-8) for this coverage (43CFR3134). For further information see the NPR-A Final EA (FEA), and Study Report 2 of the NPR-A 105(c) Land Use Study (1978).

2. Airfield Facilities

The use of existing airfields or construction of new airfields on leaseholds has been discussed in the FEA, and in Study Report 3, NPR-A 105(c) Land Use Study, Transporation.

The NPR-A Lease Form 3130-7, Section 1 (Rights of Lessee) states:

> ...together with the right to construct and maintain thereupon all works, buildings, plants, waterways, roads, telephone lines, pipelines, reservoirs, tanks, pumping stations, or other structures necessary to the full enjoyment thereof....

The lessee is granted these rights when the lease is issued. However, all activities related to the fullfillment of the lease must be approved by USGS with the concurrence of BLM within the area of operation and only by BLM outside the area of operations (43 CFR 2361.1(b)). The lessee may determine, based on economic and/or environmental reasons, to share existing or newly constructed airfields with adjoining leaseholders. BLM encourages the sharing of these facilities if possible.

3. Exchanges

On January 8, 1982, the Department of the Interior (DOI) conveyed to the Arctic Slope Regional Corporation (ASRC) approximately 5,593 acres of land located at Cape Halkett within the NPR-A. Authority under Section 1431(e)(3) of the ANILCA of December 2, 1980, provided for the exchange.

Section 1431(o)(1) provides a 40 year time frame from the date of ANILCA's enactment for the future option to exchange public lands in NPR-A or the Arctic National Wildlife Range for in-lieu subsurface lands. However, if lands in these two Reserves are opened for purposes of commercial development of oil and gas, selection/exchange must take place within 5 years from the opening date. In the case of NPR-A, the opening date was December 12, 1980, thus 4 years appear to remain for exchanges within NPR-A. These exchange lands must be within 75 miles of Village Corporation selected lands, for subsurface estate, contiguous for the most part, and compact tracts of not less than 5,760 acres.

4. Boundary Problems

Approximately 59 years ago, Executive Order 3797A established the National Petroleum Reserve No. 4 (PET-4) now known as NPR-A. There seemed to be no real need to know the precise location of the boundaries until oil and gas was discovered at Prudhoe Bay in 1968. Since that time, attempts to establish the NPR-A's limits have resulted in litigation over whether or not the boundary should be point to point encompassing the bays within the Reserve or follow the mean high tide line around them. A part of the same dispute involves the Colville River boundary. Which bank of the river is in fact the boundary: east or west bank and which bank is referred to as the right or left bank in the Executive Order.

Specific and authoritative interpretations of these boundaries are essential. Present status of State of Alaska v. Middendorf, Civil No. J75-13 (D. Alaska), on the coastal boundary; and State of Alaska v. Warner filed in the Alaska Federal District Court, October 16, 1975, on the Colville River, remain in litigation. The BLM cannot take action to lease the minerals in these areas until the litigation is terminated.

The southeastern boundary has been disputed recently by the ASRC. Based on their research, ASRC believes the true boundary is west of that shown on current Department of Interior maps and the turning point for that north-south boundary is mountain peak #5152 rather than mountain peak #4640 now being used.

An investigation has been conducted by BLM and USGS of publications and maps dating to the original surveys when the boundary was established. The field examination took place during the 1981 field season and the reports have been forwarded to the Secretary of the Interior in Washington, D.C.

Public Land Orders 5860 and 5951 affect this boundary area and will need to be modified or the lands will have to be appropriately classified to permit mineral leasing. Further details are in the FEA.

5. Mineral Leasing of Village

Village subsurface lands are subject to mineral leasing. Clearance prior to commencing activities on the lease would have to be obtained from the surface owner, the Village Corporation.

The potential lessee would be informed on surface use restrictions in the Notice of Sale, such as in the following sample:

> No drilling activities will commence until the lessee has first checked with the proper Village Corporation official concerning the planning and zoning requirements, if any, for the lands within the village boundaries. The lessee shall be required to comply with all such requirements. Any permits needed by the lessee to drill within the village boundary will be received before any drilling operations commence. All surface owners would receive the same consideration.

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Volume I:
Chapter 1
Coady, John W. Surveys of moose on and adjacent to NPR-A in 1977, p. 1-12.

Chapter 2
Davis, James L. and Patrick Valkenburg. Caribou distribution, population characteristics, mortality, and responses to disturbance in Northwest Alaska, p. 13-52.

Chapter 3
Stephenson, R.O. Abundance, movements and food habits of wolves in and adjacent to NPR-A, p. 53-87.

Chapter 4
Magoun, Audrey J. Studies of wolverines on and adjacent to NPR-A, p. 98-128.

Chapter 5
Reynolds, Harry V. Population biology, movements, distribution and habitat utilization of a grizzly bear population in NPR-A, p. 129-182.

Chapter 6
Benfield, Daniel. A survey of polar bear denning on NPR-A, 1977, p. 183-186.

Chapter 7
King, Rodney. Results of aerial surveys of migratory birds on NPR-A in 1977 and 1978, p. 187-225.

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Chapter 8
Derksen, Dirk V., William D. Eldridge and Thomas C. Rothe. Waterbird and wetland habitat studies, p. 229-311.

Chapter 9
Ritchie, Robert. A survey of cliff-nesting raptors and their habitats, p. 313-336.

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